

Test Booklet Code & Serial No.

प्रश्नपत्रिका कोड व क्रमांक

Paper-I

A

Signature and Name of Invigilator

1. (Signature)

(Name)

2. (Signature)

(Name)

APR - 00124

Time Allowed : 1 Hour]

Number of Pages in this Booklet : 24

Seat No. [] [] [] [] []

(In figures as in Admit Card)

Seat No.

(In words)

OMR Sheet No. [] [] [] [] []

(To be filled by the Candidate)

[Maximum Marks : 100

Number of Questions in this Booklet : 50

Instructions for the Candidates

1. Write your Seat No. and OMR Sheet No. in the space provided on the top of this page.
2. This paper consists of **Fifty (50)** multiple-choice type of questions. Each question will carry **two** marks. *All* questions of Paper I will be compulsory.
3. At the commencement of examination, the question booklet will be given to the student. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as follows :
 - (i) To have access to the Question Booklet, tear off the paper seal on the edge of this cover page. Do not accept a booklet without sticker-seal or open booklet.
 - (ii) Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faulty booklets due to any other or any other discrepancy should not be accepted and correct booklet should be obtained from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given. The same may please be noted.
 - (iii) After this verification is over, the OMR Sheet Number should be entered on this Test Booklet.
4. Each question has four alternative responses marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item.

Example : where (C) is the correct response.



5. Your responses to the items are to be indicated in the **OMR Sheet given inside the Booklet only**. If you mark at any place other than in the circle in the OMR Sheet, it will not be evaluated.
6. Read instructions given inside carefully.
7. Rough Work is to be done at the end of this booklet.
8. If you write your Name, Seat Number, Phone Number or put any mark on any part of the OMR Sheet, except for the space allotted for the relevant entries, which may disclose your identity, or use abusive language or employ any other unfair means, you will render yourself liable to disqualification.
9. You have to return original OMR Sheet to the invigilator at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. You are, however, allowed to carry the Test Booklet and duplicate copy of OMR Sheet on conclusion of examination.
10. Use only Blue/Black Ball point pen.
11. Use of any calculator or log table, etc., is prohibited.
12. There is no negative marking for incorrect answers.

विद्यार्थ्यसाठी महत्त्वाच्या सूचना

1. परीक्षार्थ्यांनी आपला आसन क्रमांक या पृष्ठावरील वरच्या कोपन्यात लिहावा. तसेच आपणांस दिलेल्या उत्तरपत्रिकेचा क्रमांक त्याखाली लिहावा.
2. या प्रश्नपत्रिकेत पन्नास (50) बहुनिवड प्रश्न आहेत. प्रत्येक प्रश्नास दोन गुण आहेत. या प्रश्नपत्रिकेतील सर्व प्रश्न सोडविणे अनिवार्य आहे.
3. परीक्षा सूख झाल्यावर विद्यार्थ्यांना प्रश्नपत्रिका दिली जाईल. सुरवातीच्या 5 मिनियांमध्ये आपण सदर प्रश्नपत्रिका उघडून खालील बाबी अवश्य तपासून पहावाऱ्या.
 - (i) प्रश्नपत्रिका उघडण्यासाठी प्रश्नपत्रिकेवर लावलेले सौल उघडावे. सौल नसलेली किंवा सौल उघडलेली प्रश्नपत्रिकास खोलारू नये.
 - (ii) पहिल्या पृष्ठावर नमूद केल्याप्रमाणे प्रश्नपत्रिकेची एकूण पृष्ठे तसेच प्रश्नपत्रिकेतील एकूण प्रश्नांची संख्या पडताळून पहावा. पृष्ठे कमी असलेली सदाचे प्रश्नपत्रिका सुरुवातीच्या 5 मिनियांतच पर्यवेक्षकाला परत देऊन दुसरी प्रश्नपत्रिका मागवून घ्यावी. त्यानंतर प्रश्नपत्रिका बदलून मिळणार नाही. तसेच वेळीही वाढवून मिळणार नाही याची कृपया विद्यार्थ्यांनी नोंद घ्यावी.
 - (iii) वरीलप्रमाणे सर्व पडताळून पाहिल्यानंतरच प्रश्नपत्रिकेवर ओ.एम.आर. उत्तरपत्रिकेचा नंबर लिहावा.
4. प्रत्येक प्रश्नासाठी (A), (B), (C) आणि (D) असरी चार विकल्प उत्तर दिली आहेत. त्यातील योग्य उत्तराचा रकाना खाली दर्शविल्याप्रमाणे ठळकपणे काढ्या/निव्वा करावा.
उदा. : जर (C) हे योग्य उत्तर असेल तर.
5. या प्रश्नपत्रिकेतील प्रश्नांची उत्तरे ओ.एम.आर. उत्तरपत्रिकेतच दर्शवावीत. इतर ठिकाणी लिहिलेली उत्तरे तपासली जाणार नाहीत.
6. आत दिलेल्या सूचना काळजीपूर्वक वाचावाऱ्या.
7. प्रश्नपत्रिकेच्या शेवटी जोडलेल्या को-न्या पानावरच कच्चे काम करावे.
8. जर आपण ओ.एम.आर. वर नमूद केलेल्या ठिकाणाव्यतिरिक्त इतर कोरेही नाव, आसन क्रमांक, फोन नंबर किंवा ओळख पटेल अशी कोणतीही खूण केलेली आढळून आल्यास अथवा असभ्य भाषेचा वापर किंवा इतर गैरमार्गाचा अवलंब केल्यास विद्यार्थ्यांना परीक्षेस अपात्र ठरविण्यात येईल.
9. परीक्षा संपल्यानंतर विद्यार्थ्यांने मूळ ओ.एम.आर. उत्तरपत्रिका पर्यवेक्षकांडे परत करणे आवश्यक आहे. तथापि, प्रश्नपत्रिका व ओ.एम.आर. उत्तरपत्रिकेची द्वितीय प्रत आपल्यावरोबर नेण्यास विद्यार्थ्यांना परवानगी आहे.
10. फक्त निव्वा किंवा काळजी बॉल पेनचाच वापर करावा.
11. कॅलकुलेटर किंवा लॉग टेबल वापरण्यास परवानगी नाही.
12. चुकीच्या उत्तरासाठी गुण कपात केली जाणार नाही.

Paper I
प्रश्नपत्रिका I

Time Allowed : 60 Minutes]**[Maximum Marks : 100**

Note : This Paper contains **Fifty (50)** multiple choice questions, each question carrying **Two (2)** marks. Attempt *All* questions.

सूचना : या प्रश्नपत्रिकेते पन्नास (50) बहुनिवड प्रश्न दिलोले असून प्रत्येक प्रश्नाला दोन (2) गुण आहेत.
सर्व प्रश्न सोडवा.

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| <p>1. If taught on memory level of teaching, the students get tremendous power for acquisition of</p> <ul style="list-style-type: none"> (i) factual information (ii) generalized insight (iii) problem solving abilities <p>(A) Only (ii)
(B) Only (i)
(C) (i) and (ii)
(D) (ii) and (iii)</p> <p>2. The teacher should choose teaching method considering</p> <ul style="list-style-type: none"> (i) Nature of the learners (ii) Nature of the objectives to be realized (iii) The teacher's own ability and proficiency <p>(A) Only (i)
(B) (i) and (ii)
(C) (i), (ii) and (iii)
(D) Only (ii)</p> | <p>1. जर अध्यापनाच्या स्मृती (memory) स्तरावर शिकवले तर विद्यार्थ्यांना च्या संपादनासाठी विलक्षण शक्ती मिळेल.</p> <ul style="list-style-type: none"> (i) वास्तविक माहिती (ii) सामान्यीकृत अंतर्दृष्टी (iii) समस्या निराकरण क्षमता <p>(A) केवळ (ii)
(B) केवळ (i)
(C) (i) आणि (ii)
(D) (ii) आणि (iii)</p> <p>2. विचारात घेऊन शिक्षकाने अध्यापन पद्धती निवडली पाहिजे.</p> <ul style="list-style-type: none"> (i) अध्ययनकर्त्यांचे स्वरूप (ii) साध्य करावयाच्या उद्दिष्टांचे स्वरूप (iii) शिक्षकाच्या स्वतःच्या क्षमता आणि निपुणता <p>(A) केवळ (i)
(B) (i) आणि (ii)
(C) (i), (ii) आणि (iii)
(D) केवळ (ii)</p> |
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| <p>3. What is the main characteristic of gifted students ?</p> <p>(A) They are introvert in nature
 (B) They are dependent of their peers
 (C) They are extrovert in nature
 (D) They are independent in their judgement</p> <p>4. For adult learners, instruction needs to focus</p> <p>(A) equally on the process and the content to be taught
 (B) less on the process and more on the content to be taught
 (C) more on the process and less on the content to be taught
 (D) equally on the process and the product of learning</p> <p>5. evaluation gives a clear idea about understanding of the student regarding particular content.</p> <p>(A) Placement
 (B) Formative
 (C) Summative
 (D) Diagnostic</p> | <p>3. प्रतिभावंत विद्यार्थ्यांचे मुख्य वैशिष्ट्य काय असते ?</p> <p>(A) ते अंतर्मुख स्वरूपाचे असतात
 (B) ते त्यांच्या सहाध्यायांवर अवलंबून असतात
 (C) ते बहिर्मुख स्वरूपाचे असतात
 (D) ते त्यांच्या निर्णयामध्ये स्वतंत्र असतात</p> <p>4. प्रौढ अध्ययनकर्त्त्यांसाठी, अनुदेशनामध्ये भर देण्याची गरज असते.</p> <p>(A) प्रक्रिया आणि शिकवण्याचा आशय यांवर सारखाच
 (B) प्रक्रियेवर कमी आणि शिकवण्याच्या आशयावर जास्त
 (C) प्रक्रियेवर जास्त आणि शिकवण्याच्या आशयावर कमी
 (D) प्रक्रिया आणि अध्ययनाचा परिपाक (Product) यांवर सारखाच</p> <p>5. विद्यार्थ्यांच्या विशिष्ट आशयाच्या आकलनाबाबतची स्पष्ट कल्पना मूल्यापन देते.</p> <p>(A) स्थाननिश्चिती
 (B) आकारिक
 (C) साकारिक
 (D) नैदानिक</p> |
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| <p>6. is the characteristic of qualitative research.</p> <p>(A) Emphasis on numerical data</p> <p>(B) Focus on statistical analysis</p> <p>(C) In-depth exploration of meanings and experiences</p> <p>(D) Strict adherence to experimental designs</p> | <p>6. हे गुणात्मक संशोधनाचे वैशिष्ट्य आहे.</p> <p>(A) संख्यात्मक प्रदत्तावर (डेटावर) भर</p> <p>(B) संख्याशास्त्रीय विश्लेषणावर लक्ष्य</p> <p>(C) अर्थाचे आणि अनुभवांचे सखोल शोधन</p> <p>(D) प्रायोगिक पद्धतीच्या आराखड्यास पक्के चिकटून राहाणे</p> |
| <p>7. is a limitation of positivism in research.</p> <p>(A) It ignores the importance of empirical evidence</p> <p>(B) It tends to oversimplify complex social phenomenon</p> <p>(C) It places too much emphasis on subjective interpretations</p> <p>(D) It encourages bias and personal opinions in research</p> | <p>7. ही सकारात्मक संशोधनाची मर्यादा आहे.</p> <p>(A) अनुभवजन्य पुराव्यांच्या महत्त्वाकडे दुर्लक्ष करणे</p> <p>(B) अतिजटिल सामाजिक घटनेला जास्त सुगम करण्याची प्रवृत्ती</p> <p>(C) व्यक्तिसापेक्ष अर्थनिर्वचन करण्यावर जास्त भर देणे</p> <p>(D) संशोधनामध्ये पक्षपातीपणा आणि वैयक्तिक मते यांना प्रोत्साहन देणे</p> |

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| <p>8. is referred as “citation” in the academic writing.</p> <ul style="list-style-type: none"> (A) A reference to the author’s personal experiences (B) A way of giving proper credit to the original source of information (C) A fictional element added to enhance the narrative (D) A personal opinion included without supporting evidence <p>9. type of research misconduct involves making up or falsifying data.</p> <ul style="list-style-type: none"> (A) Plagiarism (B) Fabrication (C) Misinterpretation (D) Biased sampling <p>10. ICT tool is essential for creating and managing bibliographies in research papers.</p> <ul style="list-style-type: none"> (A) Statistical software (B) Reference management software (C) Spreadsheet software (D) Project management software | <p>8. याला शैक्षणिक लेखनामध्ये “उद्धरण” असे म्हणतात.</p> <ul style="list-style-type: none"> (A) लेखकाच्या वैयक्तिक अनुभवांचा संदर्भ (B) माहितीच्या मूळ स्रोताला योग्य तो ऋणनिर्देश (क्रेडिट) देण्याचा मार्ग (C) कथन वाढविण्यासाठी जोडलेला एक काल्पनिक मार्ग (D) समर्थनार्थ पुराव्याशिवाय समाविष्ट केलेले वैयक्तिक मत <p>9. प्रकारच्या संशोधन गैरवत्नामध्ये फसवा डेटा तयार करणे किंवा खोटा डेटा तयार करणे समाविष्ट आहे.</p> <ul style="list-style-type: none"> (A) साहित्यिक चोरी/वाडमय चौर्य (B) बनावटपणा (C) चुकीचे अर्थनिर्वचन (D) पक्षपाती नमुना निवड <p>10. शोधनिबंधामध्ये ग्रंथसूची तयार करण्यासाठी आणि तिचे व्यवस्थापन करण्यासाठी वापरले जाते.</p> <ul style="list-style-type: none"> (A) सांख्यिकी सॉफ्टवेअर (B) संदर्भ व्यवस्थापन सॉफ्टवेअर (C) स्प्रेडशीट सॉफ्टवेअर (D) प्रकल्प व्यवस्थापन सॉफ्टवेअर |
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Directions :

Answer question Nos. 11 to 15 based on either English passage or Marathi passage :

It should be remembered that the Nationalist Movement in India, like all nationalist movements, was essentially a bourgeois movement. It represented the natural historical stage of development, and to consider it or to criticize it as a working class movement is wrong. Gandhi represented that movement, and the Indian masses in relation to that movement to a supreme degree, and he became the voice of Indian people to that extent. The main contribution of Gandhi to India and the Indian masses has been through the powerful movements that he launched through the National Congress. Through nation-wide action, he sought to mould the millions and largely succeeded in doing so. He changed them from a

सूचना :

प्रश्न क्रमांक 11 ते 15 हे पुढे दिलेल्या उताऱ्यावर आधारित आहेत. इंग्रजीतील किंवा मराठीतील उताऱ्यावरील प्रश्नांची उत्तरे द्या : भाषेचे क्रियाशील राजकारण महाराष्ट्रात घडले नाही. विश्वकोश, शब्दकोश, ग्रंथालय चळवळ इत्यादी घडामोडी शासनाच्या आश्रयाने तेवढ्या चालल्या. त्यापलीकडे समाजात मराठी भाषा, साहित्य, संस्कृती यांची चळवळ शून्यवत राहिली. जे विविध प्रयत्न होत राहिले, ते एकाकी अल्पजीवी किंवा अल्पशक्ती राहिले. आज सरकारविरुद्ध दंड थोपटून बंडाची भाषा करणाऱ्या साहित्य महामंडळाने, विविध साहित्य परिषदांनी, साहित्य संमेलनांनी मराठीसाठी कोणते संस्थात्मक, दीर्घ मुदतीचे विधायक राजकारण केले ? आपले भाषिक राजकारण गाववाल्या किंवा गटवाल्या पक्ख्याला अध्यक्ष करण्यासाठी संमेलन कोठे भरवायचे याच्या कारस्थानापासून सुरु होते आणि तिथेच थांबते. आपल्या

demoralized, timid, and hopeless mass, bullied and crushed by every dominant interest and incapable of resistance, to people with self-respect and self-reliance, resisting tyranny, and capable of united action and sacrifice for a larger cause. Gandhi made people think of political and economic issues, and every village and every bazaar hummed with arguments and debates on the new ideas and hopes that filled the people.

In case of very exceptional person, like Gandhi, the question of personality becomes especially important in order to understand and appraise him. To us, he represented the spirit and honour of India, the yearning of her sorrowing millions to be rid of their innumerable burdens. An insult to him by the British Government or others was an insult to India and her people.

साहित्यिक चळवळी कथाकथन आणि काव्यगायन यांच्यापुढे जाऊन साहित्यिक व तात्त्विक चर्चा मराठीतून सार्वजनिकपणे करण्याचा प्रयत्नही करीत नाहीत. मराठीच्या नावाने लेखनीच्या तलवारी करणारी वृत्तपत्रे गंभीर लेखांसाठी कधीमधी आठ पंधराशे शब्दांची जागा पुरवतात. पुस्तकपरीक्षणे तर दोनदोनशे शब्दांतच मागणारे बहादूर आपल्यात आहेत. सरकार-दरबारी सतत हात पसरून बसणारे प्रकाशक मराठीसाठी म्हणून काही प्रकाशित करायला तयार होतील का ? गंभीर लेखन, कोश वाड्मय अशा लेखनापासून प्रकाशक दूर का पळतात ? एकूणच भाषाप्रेम हा टाहो फोडण्याचा विषय न होता ती विधायक चळवळ होणे, हे भाषेचे एक पर्यायी राजकारण ठरू शकते. मराठीला नोबेल किंवा ज्ञानपीठ का मिळत नाही, असल्या गैरलागू चर्चापेक्षा केरळ शास्त्र साहित्य परिषदेप्रमाणे विज्ञान, भाषा आणि संस्कृती यांची एकवट करणारे राजकारण महाराष्ट्रात नाही, याची दखल घ्यायला हवी.

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| <p>11. The given passage states that Mahatma Gandhi largely succeeded in</p> <p>(A) fighting against the social discrimination in India
 (B) eradicating economic inequalities in India
 (C) moulding the millions in India
 (D) giving political representation to Indians</p> | <p>11. मराठी भाषा, साहित्य व संस्कृती यांची चळवळ शून्यवत राहिली असे लेखकाला का वाटते ?</p> <p>(A) व्यक्तींनी या क्षेत्रात स्वतःच्याच स्तरावर मौलिक कामगिरी केल्यामुळे
 (B) मराठी भाषा, साहित्य व संस्कृती मुळातच भक्कम असल्यामुळे
 (C) शासनाच्या आश्रयानेच राहण्याची वृत्ती आणि एकाकी प्रयत्नांमुळे
 (D) पारस्पारिक वैमनस्यामुळे</p> |
| <p>12. What do you understand by the phrase “to be rid of” ?</p> <p>(A) Released/freed from something
 (B) Tied to something
 (C) Increased something
 (D) Included something</p> | <p>12. साहित्य महामंडळ, साहित्य परिषदा यांनी काय करणे अपेक्षित होते ?</p> <p>(A) गटाताचे हितसंबंध न पाहता संस्थात्सक पातळीवर दीर्घ मुदतीचे विधायक भाषिक राजकारण करणे
 (B) गाववाल्या किंवा गटवाल्या पक्क्याला संमेलनाध्यक्ष म्हणून नाकारणे
 (C) स्थानिक कारस्थानांना खतपाणी न घालणे
 (D) समन्यायी पद्धतीने संमेलनाचा अध्यक्ष निवडणे</p> |
| <p>13. What did Mahatma Gandhi represent ?</p> <p>(A) Poverty of India
 (B) Working class movement in India
 (C) The natural historical stage of development of India
 (D) The spirit and honour of India</p> | <p>13. मराठीतील साहित्यिक चळवळींनी कोणते कार्य करायला हवे होते ?</p> <p>(A) कथाकथन व काव्यगायनाचे गावोगावी उरुस भरवणे
 (B) विरोधी विचारसरणीच्या साहित्यिकांना शह देणे
 (C) साहित्यिक चळवळी सामान्यांपर्यंत पोहोचवणे
 (D) मराठीची साहित्यिक व तात्त्विक चर्चा सार्वजनिक करणे</p> |

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| <p>14. The main contribution of Gandhi to India has been</p> <p>(A) strong arguments
 (B) the powerful movements
 (C) vociferous speeches
 (D) intermittent fasts</p> <p>15. What, do you think, is the correct meaning of the term “bourgeois” ?</p> <p>(A) Working class with utilitarian values
 (B) Agrarian class with moral values
 (C) Middle class with conventional, conservative and materialistic values
 (D) Lower class with no fixed values</p> <p>16. Which of the following messages is less likely to be misunderstood or misinterpreted due to cultural or linguistic background of the receivers of the message :</p> <p>(A) message full of written words
 (B) message full of spoken words
 (C) message full of body-gestures
 (D) message full of iconic signs</p> | <p>14. पुस्तकपरीक्षणे दोनशे शब्दांत मागणारे बहादर कोण ?</p> <p>(A) प्रकाशक
 (B) वृत्तपत्रांचे संपादक
 (C) नियतकालिकांचे संपादक
 (D) वृत्तपत्रांचे मालक</p> <p>15. प्रस्तुत लेखातून लेखक मराठी भाषेबाबतची स्थितिगती मांडताना प्रामुख्याने काय सुचवू पाहत आहे ?</p> <p>(A) व्यक्ती व संस्थांनी शासनाचा आश्रय त्यागावा
 (B) साहित्यसंमेलनांची ठिकाणे व अध्यक्ष पारदर्शकपणे निवडावेत
 (C) भावनिक टाहो न फोडता विधायक चळवळीतून भाषेचे पर्यायी राजकारण करणे
 (D) प्रकाशक व संपादकांनी माय मराठीची सेवा करणे</p> <p>16. खालीलपैकी कोणत्या प्रकारच्या संदेशाचा स्वीकारकाकडून गैरअर्थ काढण्याची वा अभिप्रेत नसलेला अन्वयार्थ काढण्याची शक्यता कमी असते ?</p> <p>(A) संपूर्णपणे लेखी शब्द असलेला संदेश
 (B) संपूर्णपणे तोंडी (उच्चारित) शब्द असलेला संदेश
 (C) शारीरिक हावभावातून पूर्णपणे साकारलेला संदेश
 (D) पूर्णपणे अर्कप्रतिमा (आयकॉन) चिन्हांनी बनलेला संदेश</p> |
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| <p>17. In the context of contemporary digital parlance what are the following symbols collectively called as :</p> <p>: –) : – (; –) : – ×</p> <p>(A) Emoji
 (B) Emoticons
 (C) Smiley
 (D) Stickers</p> <p>18. In the context of non-verbal communication identify the incorrect statement :</p> <p>(A) Silence is a means of communication
 (B) Non-verbal cues and messages are easy to control
 (C) Non-verbal messages are culture sensitive and relative
 (D) In case of confusion, people tend to trust non-verbal communication more than the verbal</p> <p>19. What is Prasar Bharati ?</p> <p>(A) It is the national level news channel under Door Darshan
 (B) It is a news broadcasting service of All India Radio (AIR)
 (C) It is the association of private broadcasters in India
 (D) It is India's state owned Public Broadcaster</p> | <p>17. समकालीन डिजिटल भाषाव्यवहारात खालील चिह्नसमूहांना इंग्रजीत सामायिकपणे काय म्हणून संबोधले जाते ?</p> <p>: –) : – (; –) : – ×</p> <p>(A) इमोजी
 (B) इमोटिकॉन्स
 (C) स्माईली
 (D) स्टीकर्स</p> <p>18. निःशब्द संज्ञापनाच्या संदर्भात खालीलपैकी कोणते विधान चूक ठरते ?</p> <p>(A) मौन हे संज्ञापनाचे साधन आहे
 (B) निःशब्द संज्ञापनातील सुगावे आणि संदेश नियंत्रणासाठी सोपे असतात
 (C) निःशब्द संज्ञापन हे संस्कृतीसापेक्ष आणि संस्कृती संवेदनशील असते
 (D) गोंधळ किंवा ट्रिधा मनस्थितीत सशब्द संज्ञापनापेक्षा निःशब्द संज्ञापनावर विश्वास ठेवण्याकडे लोकांचा कल असतो</p> <p>19. प्रसार भारती काय आहे ?</p> <p>(A) दूरदर्शनच्या अंतर्गत येणारी राष्ट्रीय स्तरावरची वृत्तवाहिनी
 (B) आकाशवाणीची (एआयआर) वृत्त प्रसारण सेवा
 (C) भारतातील खासगी प्रसारण सेवांची संघटना
 (D) भारताची शासकीय मालकीची सार्वजनिक प्रसारण सेवा</p> |
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| <p>20. Which of the following elements is facilitated much more in a communicative situation wherein teacher and students are sitting together in a circular manner facing each other ?</p> <p>(A) effectiveness of the content of teaching
 (B) teacher's power to control every student
 (C) discipline amongst the students
 (D) level of interactions between the students</p> <p>21. What is the arithmetic mean of the integers from 1 to 51 ?</p> <p>(A) 24
 (B) 25
 (C) 26
 (D) 27</p> <p>22. If 10^m (m is positive integer) divides the product of the integers from 101 to 151, then the maximum value of m is :</p> <p>(A) 12
 (B) 13
 (C) 11
 (D) 10</p> | <p>20. जेव्हा शिक्षक आणि विद्यार्थी एकमेकांकडे तोंड करून वर्तुळाकृती रचनेत बसलेले असतात, अशा संज्ञापन प्रसंगामध्ये खालीलपैकी कोणत्या घटकाला अधिक प्रमाणात उत्तेजन मिळते ?</p> <p>(A) शिकविण्याच्या आशयाचे प्रभावीपण
 (B) प्रत्येक विद्यार्थ्यावर नियंत्रण ठेवण्याची शिक्षकांची क्षमता
 (C) विद्यार्थ्यांमधील शिस्त
 (D) विद्यार्थ्यांमधील आंतरसंवादाची पातळी</p> <p>21. 1 ते 51 या पूर्णांक संख्यांची गणित मध्य किती ?</p> <p>(A) 24
 (B) 25
 (C) 26
 (D) 27</p> <p>22. जर 10^m (m धन पूर्णांक आहे) या संख्येने 101 ते 151 या पूर्णांक संख्यांच्या गुणाकाराने निःशेष भाग जातो तर m ची मोठ्यात मोठी किंमत किती ?</p> <p>(A) 12
 (B) 13
 (C) 11
 (D) 10</p> |
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23. Among the three numbers, $X = 188181811881$, $Y = 881181811818$ and $Z = 811881188118$ which numbers are divisible by 18 ?
- (A) X only
 (B) Y and Z only
 (C) Z only
 (D) X, Y and Z
24. A person was working to transfer bricks from a place X to a place Y, where the distance between X and Y is 200 meters. At a time the person was carrying 15 bricks. Starting from the place X, after travelling 5.5 km while working, how many bricks were shifted to the place Y by the person ?
- (A) 190
 (B) 195
 (C) 210
 (D) 215
25. There are 64 deer in a forest in the present year. If $x(n)$ denotes the number of deer in the forest in year n and that $x(n) = \frac{3}{2}x(n-1)$ for $n = 1, 2, 3, \dots$, how many deer are there in 5th year in the forest ?
- (A) 96
 (B) 486
 (C) 243
 (D) 339
23. दिलेल्या $X = 188181811881$, $Y = 881181811818$ व $Z = 811881188118$ संख्यापैकी कोणत्या संख्यांस 18 ने निःशेष भाग जातो ?
- (A) X फक्त
 (B) Y व Z फक्त
 (C) Z फक्त
 (D) X, Y व Z
24. एक व्यक्ती X या ठिकाणापासून Y या ठिकाणी विटा वाहून नेण्याचे काम करत आहे. X आणि Y या ठिकाणांमधील अंतर 200 मीटर आहे. ती व्यक्ती एका वेळेस 15 विटा वाहून नेते. त्या व्यक्तीने X या ठिकाणापासून कामास सुरुवात केल्यास व 5.5 किमी. अंतर पार केलेले असताना Y या ठिकाणी किती विटा पोहोचविल्या ?
- (A) 190
 (B) 195
 (C) 210
 (D) 215
25. एका जंगलामध्ये चालू वर्षात 64 हरिणे आहेत. जर $x(n)$ ही संख्या त्या जंगलातील n व्या वर्षातील हरिणांची संख्या दर्शविते व $x(n) = \frac{3}{2}x(n-1)$, $n = 1, 2, 3, \dots$, असेल, तर 5व्या वर्षातील त्या जंगलातील हरिणांची संख्या किती ?
- (A) 96
 (B) 486
 (C) 243
 (D) 339

26. Which of the following conclusion/s is/are valid based on the statements given below ?

Statement I : Some tigers are goats.

Statement II : All political leaders are intelligent.

Conclusion 1 : Some goats are not tigers.

Conclusion 2 : Some political leaders are intelligent.

Code :

- (A) 1 only
- (B) 2 only
- (C) 1 and 2 both
- (D) Neither 1 nor 2

27. Some buses are standing facing the bus stand. Thane bus was ahead of Nasik bus, which was ahead of Jalgaon bus. Amravati bus was behind Dhule bus, but ahead of Thane bus. Which is the second last bus from behind ?

- (A) Thane
- (B) Jalgaon
- (C) Nasik
- (D) Amravati

26. खालील विधानांच्या आधारे पुढीलपैकी कोणते/ता निष्कर्ष उचित आहेत ?

विधान I : काही वाघ हे बकरे आहेत.

विधान II : सर्व राजकीय नेते बुद्धिमान असतात.

निष्कर्ष 1 : काही बकरे वाघ नाहीत.

निष्कर्ष 2 : काही राजकीय नेते बुद्धिमान असतात.

कोड :

- (A) 1 फक्त
- (B) 2 फक्त
- (C) 1 आणि 2 दोन्हीही
- (D) 1 आणि 2 यापैकी नाही

27. काही बस बसथांब्यावर समोर तोंड करून उऱ्या आहेत. ठाण्याची बस नासिक बसच्या पुढे आहे आणि नासिकची बस जळगांव बसच्या पुढे आहे. अमरावती बस धुळे बसच्या मागे आहे परंतु ठाणे बसच्या पुढे आहे. तर मागून दोन नंबरची बस कोणती आहे ?

- (A) ठाणे
- (B) जळगांव
- (C) नासिक
- (D) अमरावती

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| <p>28. In a code language if JKLM is coded as OSVX, then how DEFG will be coded in the same language ?</p> <p>(A) ILNQ
(B) JLNP
(C) KMOR
(D) IMPR</p> <p>29. In a code language if DAC means 635, then what will be the code for FEG ?</p> <p>(A) 879
(B) 678
(C) 587
(D) 897</p> <p>30. While facing south, Virat walks 15 meters and then turns to his right and walks 10 meters. From there he turns to his right and walks 15 meters. Then he turns to his left and walks 15 meters. Which direction is he facing now and how much away from the starting point ?</p> <p>(A) East, 15 meters
(B) West, 25 meters
(C) North, 15 meters
(D) South, 40 meters</p> | <p>28. एका सांकेतिक भाषेत जर JKLM चे रूपांतर OSVX असे आहे. तर त्याच भाषेत DEFG चे रूपांतर काय असेल ?</p> <p>(A) ILNQ
(B) JLNP
(C) KMOR
(D) IMPR</p> <p>29. एका सांकेतिक भाषेत जर DAC चा संकेतांक 635 असा होतो, तर FEG चा संकेतांक काय असेल ?</p> <p>(A) 879
(B) 678
(C) 587
(D) 897</p> <p>30. दक्षिणेकडे तोंड करून विराट 15 मीटर चालतो आणि तो नंतर स्वतःच्या उजवीकडे वळून 10 मीटर चालतो. त्यानंतर तो उजवीकडे वळून 15 मीटर चालतो. नंतर तो डावीकडे वळून 15 मीटर चालतो. तर तो कोणत्या दिशेला तोंड करून आणि मूळ ठिकाणापासून किती अंतरावर उभा आहे ?</p> <p>(A) पूर्व, 15 मीटर
(B) पश्चिम, 25 मीटर
(C) उत्तर, 15 मीटर
(D) दक्षिण, 40 मीटर</p> |
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Directions :

Question numbers **31** and **32** are based on the following information :

Following is a table representing foreign tourists visiting different places in India in a certain year. (Figures are in lakhs).

Type Place	American	English	French	Other	Total
Agra	6.5	3.8	3.5	1.2	15.0
Delhi	8.2	8.7	2.7	0.4	20.0
Chennai	3.7	3.3	2.4	0.6	10.0
Udaipur	2.8	1.3	1.5	0.4	6.0
Bangalore	3.0	1.2	1.3	0.5	6.0
Shrinagar	1.0	0.8	1.1	0.1	3.0

31. What is percentage of total number of tourists visiting Agra ?
- (A) 33.33%
 - (B) 25.00%
 - (C) 16.67%
 - (D) 10.00%
32. Which type of tourists found maximum at Delhi ?
- (A) American
 - (B) English
 - (C) French
 - (D) Other

सूचना :

प्रश्न क्रमांक **31** आणि **32** पुढील माहितीवर आधारित आहेत :

भारतात ठराविक वर्षात विविध ठिकाणी भेटी देणाऱ्या परदेशी प्रवाशांची माहिती पुढील सारणीमध्ये दिलेली आहे (आकडे लाखामध्ये आहेत).

प्रकार ठिकाण	अमेरिकन	इंग्लिश	फ्रेंच	इतर	एकूण
आग्रा	6.5	3.8	3.5	1.2	15.0
दिल्ली	8.2	8.7	2.7	0.4	20.0
चेन्नई	3.7	3.3	2.4	0.6	10.0
उदयपूर	2.8	1.3	1.5	0.4	6.0
बंगलोर	3.0	1.2	1.3	0.5	6.0
श्रीनगर	1.0	0.8	1.1	0.1	3.0

31. आग्रा शहरास भेट देणाऱ्या एकूण प्रवाशांची शेकडेवारी किती ?
- (A) 33.33%
 - (B) 25.00%
 - (C) 16.67%
 - (D) 10.00%
32. दिल्लीमध्ये कोणत्या प्रकारचे प्रवासी सर्वात जास्त आढळतात ?
- (A) अमेरिकन
 - (B) इंग्लिश
 - (C) फ्रेंच
 - (D) इतर

Directions :

Question numbers 33 and 34 are based on the following information :

Following table gives itemwise expenditure of construction of house.

Item	Expenditure (%)
Labour	25
Cement and Bricks	30
Steel	15
Timber and Glass	20
Miscellaneous	10

33. The information in the above table is to be represented diagrammatically using Pie diagram. What will be the angle of the sector representing item labour ?
- (A) 50°
 (B) 30°
 (C) 90°
 (D) 25°
34. What is the ratio of expenditure of the item cement and bricks to the total expenditure of construction of house ?
- (A) $1 : 3$
 (B) $1 : 4$
 (C) $2 : 5$
 (D) $3 : 10$

सूचना :

प्रश्न क्रमांक 33 आणि 34 हे पुढील माहितीवर आधारित आहेत :

पुढील सारणी घरबांधणीचा विविध कलमां-प्रमाणे झालेला खर्च देत आहे.

कलम	खर्च (%)
मजुरी	25
सिमेंट आणि विटा	30
लोखंड	15
लाकूड आणि काच	20
अन्य	10

33. वरील सारणीमधील माहिती वर्तुळ चित्राच्या (Pie diagram) साहाय्याने दाखवायची आहे. मजुरी या कलमासाठी असणाऱ्या वर्तुळपाकळीचा (Sector) कोन किती अंशाचा असेल ?
- (A) 50°
 (B) 30°
 (C) 90°
 (D) 25°
34. सिमेंट आणि विटा या कलमासाठी झालेल्या खर्चाचे घराच्या बांधकामासाठी झालेल्या एकूण खर्चाशी गुणोत्तर काय आहे ?
- (A) $1 : 3$
 (B) $1 : 4$
 (C) $2 : 5$
 (D) $3 : 10$

35. The following (X, Y) points are plotted on X-Y plane and the adjacent points are joined by smooth curve :

X	Y
1	60
2	30
3	20
4	15
5	12

What will be the nature of curve ?

- (A) Straight line
 - (B) Parabola
 - (C) Hyperbola
 - (D) Exponential curve
36. Identify the correct pair from the following :
- (A) Pxl – unit of focus of digital cameras
 - (B) HDD – unit of high definition of digital screens
 - (C) Kbps – unit of data transfer rate
 - (D) Ghz – unit of memory storage on digital devices

35. पुढील (X, Y) बिंदू X-Y प्रतलावर रेखाटले व सलगचे बिंदू नितळ (smooth) वक्राने जोडले :

X	Y
1	60
2	30
3	20
4	15
5	12

या वक्राचे स्वरूप कोणते असेल ?

- (A) सरळ रेषा
 - (B) अन्वस्त (Parabola)
 - (C) अपास्त (Hyperbola)
 - (D) घातांकी वक्र (Exponential curve)
36. खालीलपैकी कोणती जोडी योग्य आहे ?
- (A) Pxl – डिजिटल कॅमेराचा फोकस मापनाचे एकक
 - (B) HDD – डिजिटल पड्यांच्या उच्च स्पष्टतेचे (डेफिनेशन) एकक
 - (C) Kbps – विदा (डेटा) हस्तांतर वेगाचे एकक
 - (D) Ghz – डिजिटल उपकरणांमधील स्मृती साठवणुकीचे एकक

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| <p>37. When you access a site with 'https' instead of 'http' in the address bar, it primarily means :</p> <p>(A) You are accessing a speedy connection</p> <p>(B) You are accessing a secure communication</p> <p>(C) You are accessing a single date line transfer</p> <p>(D) You are accessing a smartphone friendly website</p> <p>38. Which of the following shows the correct chronological order of the first launch of these internet based facilities ?</p> <p>(A) YouTube, Gmail, Instagram, Wikipedia</p> <p>(B) Wikipedia, YouTube, Gmail, Instagram</p> <p>(C) Gmail, Wikipedia, YouTube, Instagram</p> <p>(D) Wikipedia, Gmail, YouTube, Instagram</p> | <p>37. 'http' ऐवजी 'https' अशी इंग्रजी अक्षरे अँडेसबारमध्ये असणारी वेबसाईट तुम्ही जेव्हा वापरता तेव्हा तुम्ही :</p> <p>(A) एक वेगवान इंटरनेट जुळणी (जोड) वापरत असता</p> <p>(B) एक सुरक्षित संपर्क जोड वापरत असता</p> <p>(C) विदा हस्तांतराचा एकच मार्ग वापरत असता</p> <p>(D) स्मार्टफोनशी अनुरूप वेबसाईट वापरत असता</p> <p>38. इंटरनेटवरील खालील डिजिटल सेवा सर्वप्रथम सुरु झाल्याचे वर्ष या निकषावर खालीलपैकी कोणता पर्याय योग्य कालानुक्रम दर्शवितो ?</p> <p>(A) युट्यूब, जीमेल, इन्स्टाग्राम, विकिपिडिया</p> <p>(B) विकिपिडिया, युट्यूब, जीमेल, इन्स्टाग्राम</p> <p>(C) जीमेल, विकिपिडिया, युट्यूब, इन्स्टाग्राम</p> <p>(D) विकिपिडिया, जीमेल, युट्यूब, इन्स्टाग्राम</p> |
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| <p>39. Which of the following has not been appointed as a national coordinator for SWAYAM to ensure the quality of the course content ?</p> <p>(A) Indian Institute of Science (IISc)
(B) National Institute of Open Schooling (NIOS)
(C) Indian Institute of Management, Bangalore (IIMB)
(D) Consortium for Educational Communication (CEC)</p> <p>40. In the context of 'Web 2.0' digital environment what does the abbreviation UGC stand for ?</p> <p>(A) University Grants Commission
(B) User Generated Content
(C) Unique Graphic Coding
(D) Universal Graphic Chip-set</p> <p>41. When were Millennium Development Goals (MDGs) adopted by the United Nations ?</p> <p>(A) 1990
(B) 1995
(C) 2000
(D) 2010</p> | <p>39. स्वयमवरील (SWAYAM) अभ्यासक्रमांच्या आशयाचा दर्जा राखण्यासाठी खालीलपैकी कोणत्या संस्थेची राष्ट्रीय समन्वयक म्हणून नियुक्ती झालेली नाही ?</p> <p>(A) भारतीय विज्ञान संस्थान (आयआयएससी)
(B) राष्ट्रीय मुक्त विद्यालक्षी शिक्षण संस्था (एनआयओएस)
(C) भारतीय व्यवस्थापन संस्था बंगळुरू (अयआयएमबी)
(D) शैक्षणिक संज्ञापन सहयोग (सीईसी)</p> <p>40. 'वेब 2.0' डिजिटल व्यवस्थेच्या संदर्भात UGC या इंग्रजीतील लघुरूप खालीलपैकी कोणती (इंग्रजी) संज्ञा दर्शविते ?</p> <p>(A) युनिव्हर्सिटी ग्रॅंट्स कमिशन
(B) युजर जनरेटेड कॅटेन्ट
(C) युनिक ग्राफिक कोडिंग
(D) युनिव्हर्सल ग्राफिक चिप-सेट</p> <p>41. संयुक्त राष्ट्रांनी सहस्राब्दी विकास उद्दिष्टे (MDGs) कधी स्वीकारली ?</p> <p>(A) 1990
(B) 1995
(C) 2000
(D) 2010</p> |
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| <p>42. What is the target year for achieving the Sustainable Development Goals ?</p> <p>(A) 2020
(B) 2025
(C) 2030
(D) 2040</p> <p>43. Which of the following is the effect of photochemical smog ?</p> <p>(A) Headaches, eyes, nose and throat irritation
(B) Gastrointestinal disorders
(C) Renal disorders
(D) Bone disorders</p> <p>44. What is the term for the process of inoculating microbes into soil ?</p> <p>(A) Bioventing
(B) Biostimulation
(C) Bioaugmentation
(D) Biosparaging</p> | <p>42. शाश्वत विकास उद्दिष्टे साध्य करण्यासाठी निर्धारित वर्ष कोणते ?</p> <p>(A) 2020
(B) 2025
(C) 2030
(D) 2040</p> <p>43. खालीलपैकी कोणता प्रकाशरासायनिक धुरव्याचा परिणाम आहे ?</p> <p>(A) डोकेदुखी, डोळे, नाक, घसा यांची जळजळ
(B) उदर आणि आतड्याचे विकार
(C) मूत्रपिंडाचे विकार
(D) हाडांचे विकार</p> <p>44. मातीमधे सूक्ष्मजीवांचे संरोपण करण्याच्या प्रक्रियेला काय म्हणतात ?</p> <p>(A) जैविक-निर्गमन
(B) जैविक-उत्तेजना
(C) सूक्ष्मजीव आवर्धित करणे
(D) जैविक शिडकावा करणे</p> |
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| <p>45. Which component of a solar panel is responsible for directly generating electric current when exposed to sunlight ?</p> <p>(A) Inverter
 (B) Semiconductor material
 (C) Reflectors
 (D) Batteries</p> <p>46. Environmental Education is not just awareness and knowledge, but it is also development of</p> <p>(A) Deeper knowledge
 (B) Theoretic knowledge
 (C) Proper attitude
 (D) Proper concepts</p> <p>47. Indian education system generally is divided into following periods :</p> <p>(A) Vedic period, Buddhist period, Muslim period, British period, Post-Independence period
 (B) Hindu period, Buddhist period, Jain period, Muslim period, British period
 (C) Vedic period, Ramayan period, Mahabharat period, Jain period, British period
 (D) Upanishadic period, Puranas period, Buddhist period, Muslim period, Modern period</p> | <p>45. सुर्यप्रकाशाच्या संपर्कात आल्यावर सौर पटलाचा कोणता घटक थेट विद्युत प्रवाह निर्माण करण्यास जबाबदार असतो ?</p> <p>(A) अखंड विद्युत पुरवठा यंत्र
 (B) अर्धसंवाहक सामग्री
 (C) परावर्तक
 (D) विजेरी संच</p> <p>46. पर्यावरण शिक्षण हे फक्त जाणीव जागृती व ज्ञान नव्हे, तर त्यामध्ये चा विकासही अभिप्रेत आहे.</p> <p>(A) सखोल ज्ञान
 (B) सैद्धान्तिक ज्ञान
 (C) योग्य अभिवृत्ती
 (D) योग्य संकल्पना</p> <p>47. भारतीय शिक्षण व्यवस्थेचे सामान्यतः खालील विभाग केले जातात :</p> <p>(A) वैदिक काळ, बौद्ध काळ, मुस्लिम काळ, ब्रिटिश काळ, स्वातंत्र्योत्तर काळ
 (B) हिंदू काळ, बौद्ध काळ, जैन काळ, मुस्लिम काळ, ब्रिटिश काळ
 (C) वैदिक काळ, रामायण काळ, महाभारत काळ, जैन काळ, ब्रिटीश काळ
 (D) उपनिषद काळ, पुराण काळ, बौद्ध काळ, मुस्लिम काळ, आधुनिक काळ</p> |
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| <p>48. In correspondence education system the following things are included :</p> <p>(A) Only guiding instructions</p> <p>(B) Only solved answers through letters</p> <p>(C) Guiding instructions and solved answers</p> <p>(D) Guiding instructions, solved answers and occasional lectures</p> <p>49. The First Open University was started in 1969 at</p> <p>(A) Chicago in America</p> <p>(B) Milton Kenis in England</p> <p>(C) Paris in France</p> <p>(D) Delhi in India</p> <p>50. According to Muslim System of Education, 'Madarsa' is supposed to be the centre of</p> <p>(A) Primary Education</p> <p>(B) Secondary Education</p> <p>(C) Higher Education</p> <p>(D) Technical Education</p> | <p>48. पत्रव्यवहाराद्वारे शिक्षण व्यवस्थेत खालील गोष्टींचा समावेश होतो :</p> <p>(A) फक्त मार्गदर्शक सूचना</p> <p>(B) फक्त सोडविलेली उत्तरे</p> <p>(C) मार्गदर्शक सूचना आणि सोडविलेली उत्तरे</p> <p>(D) मार्गदर्शक सूचना, सोडविलेली उत्तरे आणि प्रासंगिक व्याख्याने</p> <p>49. पहिल्या मुक्त विद्यापीठाची स्थापन 1969 मध्ये येथे स्थापन झाली.</p> <p>(A) अमेरिकेतील शिकागो</p> <p>(B) इंग्लंडमधील मिल्टन केनिस</p> <p>(C) फ्रान्समधील पैरिस</p> <p>(D) भारतातील दिल्ली</p> <p>50. मुस्लिम शिक्षण पद्धतीनुसार 'मदरसा' हे केंद्र समजले जाते.</p> <p>(A) प्राथमिक शिक्षण</p> <p>(B) माध्यमिक शिक्षण</p> <p>(C) उच्च शिक्षण</p> <p>(D) तांत्रिक शिक्षण</p> |
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Paper I
प्रश्नपत्रिका I

Time Allowed : 60 Minutes]**[Maximum Marks : 100**

Note : This Paper contains **Fifty (50)** multiple choice questions, each question carrying **Two (2)** marks. Attempt *All* questions.

सूचना : या प्रश्नपत्रिकेते पन्नास (50) बहुनिवड प्रश्न दिलेले असून प्रत्येक प्रश्नाला दोन (2) गुण आहेत.
सर्व प्रश्न सोडवा.

Directions :

**Answer question Nos. 1 to 5
based on either English passage
or Marathi passage :**

It should be remembered that the Nationalist Movement in India, like all nationalist movements, was essentially a bourgeois movement. It represented the natural historical stage of development, and to consider it or to criticize it as a working class movement is wrong. Gandhi represented that movement, and the Indian masses in relation to that movement to a supreme degree, and he became the voice of Indian people to that extent. The main contribution of Gandhi to India and the Indian masses has been through the powerful movements that he launched through the National Congress. Through nation-wide

सूचना :

प्रश्न क्रमांक 1 ते 5 हे पुढे दिलेल्या उताऱ्यावर आधारित आहेत. इंग्रजीतील किंवा मराठीतील उताऱ्यावरील प्रश्नांची उत्तरे द्या :

भाषेचे क्रियाशील राजकारण महाराष्ट्रात घडले नाही. विश्वकोश, शब्दकोश, ग्रंथालय चळवळ इत्यादी घडामोडी शासनाच्या आश्रयाने तेवढ्या चालल्या. त्यापलीकडे समाजात मराठी भाषा, साहित्य, संस्कृती यांची चळवळ शून्यवत राहिली. जे विविध प्रयत्न होत राहिले, ते एकाकी अल्पजीवी किंवा अल्पशक्ती राहिले. आज सरकारविरुद्ध दंड थोपटून बंडाची भाषा करणाऱ्या साहित्य महामंडळाने, विविध साहित्य परिषदांनी, साहित्य संमेलनांनी मराठीसाठी कोणते संस्थात्मक, दीर्घ मुदतीचे विधायक राजकारण केले ? आपले भाषिक राजकारण गाववाल्या किंवा गटवांल्या पक्ख्याला अध्यक्ष करण्यासाठी

action, he sought to mould the millions and largely succeeded in doing so. He changed them from a demoralized, timid, and hopeless mass, bullied and crushed by every dominant interest and incapable of resistance, to people with self-respect and self-reliance, resisting tyranny, and capable of united action and sacrifice for a larger cause. Gandhi made people think of political and economic issues, and every village and every bazaar hummed with arguments and debates on the new ideas and hopes that filled the people.

In case of very exceptional person, like Gandhi, the question of personality becomes especially important in order to understand and appraise him. To us, he represented the spirit and honour of India, the yearning of her sorrowing millions to be rid of their innumerable burdens. An insult to him by the British Government or others was an insult to India and her people.

संमेलन कोठे भरवायचे याच्या कारस्थानापासून सुरु होते आणि तिथेच थांबते. आपल्या साहित्यिक चळवळी कथाकथन आणि काव्यगायन यांच्यापुढे जाऊन साहित्यिक व तात्त्विक चर्चा मराठीतून सार्वजनिकपणे करण्याचा प्रयत्नही करीत नाहीत. मराठीच्या नावाने लेखनीच्या तलवारी करणारी वृत्तपत्रे गंभीर लेखांसाठी कधीमधी आठ पंधराशे शब्दांची जागा पुरवतात. पुस्तकपरीक्षणे तर दोनदोनशे शब्दांतच मागणारे बहादुर आपल्यात आहेत. सरकार-दरबारी सतत हात पसरून बसणारे प्रकाशक मराठीसाठी म्हणून काही प्रकाशित करायला तयार होतील का ? गंभीर लेखन, कोश वाड्मय अशा लेखनापासून प्रकाशक दूर का पळतात ? एकूणच भाषाप्रेम हा टाहो फोडण्याचा विषय न होता ती विधायक चळवळ होणे, हे भाषेचे एक पर्यायी राजकारण ठरू शकते. मराठीला नोबेल किंवा ज्ञानपीठ का मिळत नाही, असल्या गैरलागू चर्चापेक्षा केरळ शास्त्र साहित्य परिषदेप्रमाणे विज्ञान, भाषा आणि संस्कृती यांची एकवट करणारे राजकारण महाराष्ट्रात नाही, याची दखल घ्यायला हवी.

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| <p>1. The given passage states that Mahatma Gandhi largely succeeded in</p> <p>(A) fighting against the social discrimination in India
(B) eradicating economic inequalities in India
(C) moulding the millions in India
(D) giving political representation to Indians</p> <p>2. What do you understand by the phrase “to be rid of” ?</p> <p>(A) Released/freed from something
(B) Tied to something
(C) Increased something
(D) Included something</p> <p>3. What did Mahatma Gandhi represent ?</p> <p>(A) Poverty of India
(B) Working class movement in India
(C) The natural historical stage of development of India
(D) The spirit and honour of India</p> | <p>1. मराठी भाषा, साहित्य व संस्कृती यांची चळवळ शून्यवत राहिली असे लेखकाला का वाटते ?</p> <p>(A) व्यक्तींनी या क्षेत्रात स्वतःच्याच स्तरावर मौलिक कामगिरी केल्यामुळे
(B) मराठी भाषा, साहित्य व संस्कृती मुळातच भक्कम असल्यामुळे
(C) शासनाच्या आश्रयानेच राहण्याची वृत्ती आणि एकाकी प्रयत्नांमुळे
(D) पारस्पारिक वैमनस्यामुळे</p> <p>2. साहित्य महामंडळ, साहित्य परिषदा यांनी काय करणे अपेक्षित होते ?</p> <p>(A) गटातटाचे हितसंबंध न पाहता संस्थात्मक पातळीवर दीर्घ मुदतीचे विधायक भाषिक राजकारण करणे
(B) गावबाल्या किंवा गटबाल्या पढ्याला संमेलनाध्यक्ष म्हणून नाकारणे
(C) स्थानिक कारस्थानांना खतपाणी न घालणे
(D) समन्यायी पद्धतीने संमेलनाचा अध्यक्ष निवडणे</p> <p>3. मराठीतील साहित्यिक चळवळींनी कोणते कार्य करायला हवे होते ?</p> <p>(A) कथाकथन व काव्यगायनाचे गावोगावी उरुस भरवणे
(B) विरोधी विचारसरणीच्या साहित्यिकांना शह देणे
(C) साहित्यिक चळवळी सामान्यांपर्यंत पोहोचवणे
(D) मराठीची साहित्यिक व तात्त्विक चर्चा सार्वजनिक करणे</p> |
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| <p>4. The main contribution of Gandhi to India has been</p> <p>(A) strong arguments
 (B) the powerful movements
 (C) vociferous speeches
 (D) intermittent fasts</p> <p>5. What, do you think, is the correct meaning of the term “bourgeois” ?</p> <p>(A) Working class with utilitarian values
 (B) Agrarian class with moral values
 (C) Middle class with conventional, conservative and materialistic values
 (D) Lower class with no fixed values</p> <p>6. Which of the following messages is less likely to be misunderstood or misinterpreted due to cultural or linguistic background of the receivers of the message :</p> <p>(A) message full of written words
 (B) message full of spoken words
 (C) message full of body-gestures
 (D) message full of iconic signs</p> | <p>4. पुस्तकपरीक्षणे दोनशे शब्दांत मागणारे बहादर कोण ?</p> <p>(A) प्रकाशक
 (B) वृत्तपत्रांचे संपादक
 (C) नियतकालिकांचे संपादक
 (D) वृत्तपत्रांचे मालक</p> <p>5. प्रस्तुत लेखातून लेखक मराठी भाषेबाबतची स्थितिगती मांडताना प्रामुख्याने काय सुचवू पाहत आहे ?</p> <p>(A) व्यक्ती व संस्थांनी शासनाचा आश्रय त्यागावा
 (B) साहित्यसंमेलनांची ठिकाणे व अध्यक्ष पारदर्शकपणे निवडावेत
 (C) भावनिक टाहो न फोडता विधायक चळवळीतून भाषेचे पर्यायी राजकारण करणे
 (D) प्रकाशक व संपादकांनी माय मराठीची सेवा करणे</p> <p>6. खालीलपैकी कोणत्या प्रकारच्या संदेशाचा स्वीकारकाकडून गैरअर्थ काढण्याची वा अभिप्रेत नसलेला अन्वयार्थ काढण्याची शक्यता कमी असते ?</p> <p>(A) संपूर्णपणे लेखी शब्द असलेला संदेश
 (B) संपूर्णपणे तोंडी (उच्चारित) शब्द असलेला संदेश
 (C) शारीरिक हावभावातून पूर्णपणे साकारलेला संदेश
 (D) पूर्णपणे अर्कप्रतिमा (आयकॉन) चिन्हांनी बनलेला संदेश</p> |
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| <p>7. In the context of contemporary digital parlance what are the following symbols collectively called as :</p> <p>: –) : – (; –) : – ×</p> <p>(A) Emoji
 (B) Emoticons
 (C) Smiley
 (D) Stickers</p> <p>8. In the context of non-verbal communication identify the incorrect statement :</p> <p>(A) Silence is a means of communication
 (B) Non-verbal cues and messages are easy to control
 (C) Non-verbal messages are culture sensitive and relative
 (D) In case of confusion, people tend to trust non-verbal communication more than the verbal</p> <p>9. What is Prasar Bharati ?</p> <p>(A) It is the national level news channel under Door Darshan
 (B) It is a news broadcasting service of All India Radio (AIR)
 (C) It is the association of private broadcasters in India
 (D) It is India's state owned Public Broadcaster</p> | <p>7. समकालीन डिजिटल भाषाव्यवहारात खालील चिह्नसमूहांना इंग्रजीत सामायिकपणे काय म्हणून संबोधले जाते ?</p> <p>: –) : – (; –) : – ×</p> <p>(A) इमोजी
 (B) इमोटिकॉन्स
 (C) स्माईली
 (D) स्टीकर्स</p> <p>8. निःशब्द संज्ञापनाच्या संदर्भात खालीलपैकी कोणते विधान चूक ठरते ?</p> <p>(A) मौन हे संज्ञापनाचे साधन आहे
 (B) निःशब्द संज्ञापनातील सुगावे आणि संदेश नियंत्रणासाठी सोपे असतात
 (C) निःशब्द संज्ञापन हे संस्कृतीसापेक्ष आणि संस्कृती संवेदनशील असते
 (D) गोंधळ किंवा द्विधा मनस्थितीत सशब्द संज्ञापनापेक्षा निःशब्द संज्ञापनावर विश्वास ठेवण्याकडे लोकांचा कल असते</p> <p>9. प्रसार भारती काय आहे ?</p> <p>(A) दूरदर्शनच्या अंतर्गत येणारी राष्ट्रीय स्तरावरची वृत्तवाहिनी
 (B) आकाशवाणीची (एआयआर) वृत्त प्रसारण सेवा
 (C) भारतातील खासगी प्रसारण सेवांची संघटना
 (D) भारताची शासकीय मालकीची सार्वजनिक प्रसारण सेवा</p> |
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10. Which of the following elements is facilitated much more in a communicative situation wherein teacher and students are sitting together in a circular manner facing each other ?
- effectiveness of the content of teaching
 - teacher's power to control every student
 - discipline amongst the students
 - level of interactions between the students
11. What is the arithmetic mean of the integers from 1 to 51 ?
- 24
 - 25
 - 26
 - 27
12. If 10^m (m is positive integer) divides the product of the integers from 101 to 151, then the maximum value of m is :
- 12
 - 13
 - 11
 - 10
10. जेव्हा शिक्षक आणि विद्यार्थी एकमेकांकडे तोंड करून वर्तुळाकृती रचनेत बसलेले असतात, अशा संज्ञापन प्रसंगामध्ये खालीलपैकी कोणत्या घटकाला अधिक प्रमाणात उत्तेजन मिळते ?
- शिकविण्याच्या आशयाचे प्रभावीपण
 - प्रत्येक विद्यार्थ्यावर नियंत्रण ठेवण्याची शिक्षकांची क्षमता
 - विद्यार्थ्यांमधील शिस्त
 - विद्यार्थ्यांमधील आंतरसंवादाची पातळी
11. 1 ते 51 या पूर्णांक संख्यांची गणित मध्य किती ?
- 24
 - 25
 - 26
 - 27
12. जर 10^m (m धन पूर्णांक आहे) या संख्येने 101 ते 151 या पूर्णांक संख्यांच्या गुणाकाराने निःशेष भाग जातो तर m ची मोठ्यात मोठी किंमत किती ?
- 12
 - 13
 - 11
 - 10

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13. Among the three numbers, $X = 188181811881$, $Y = 881181811818$ and $Z = 811881188118$ which numbers are divisible by 18 ?
- (A) X only
(B) Y and Z only
(C) Z only
(D) X, Y and Z
14. A person was working to transfer bricks from a place X to a place Y, where the distance between X and Y is 200 meters. At a time the person was carrying 15 bricks. Starting from the place X, after travelling 5.5 km while working, how many bricks were shifted to the place Y by the person ?
- (A) 190
(B) 195
(C) 210
(D) 215
15. There are 64 deer in a forest in the present year. If $x(n)$ denotes the number of deer in the forest in year n and that $x(n) = \frac{3}{2}x(n-1)$ for $n = 1, 2, 3, \dots$, how many deer are there in 5th year in the forest ?
- (A) 96
(B) 486
(C) 243
(D) 339
13. दिलेल्या $X = 188181811881$, $Y = 881181811818$ व $Z = 811881188118$ संख्यापैकी कोणत्या संख्यास 18 ने निःशेष भाग जातो ?
- (A) X फक्त
(B) Y व Z फक्त
(C) Z फक्त
(D) X, Y व Z
14. एक व्यक्ती X या ठिकाणापासून Y या ठिकाणी विटा वाहून नेण्याचे काम करत आहे. X आणि Y या ठिकाणांमधील अंतर 200 मीटर आहे. ती व्यक्ती एका वेळेस 15 विटा वाहून नेते. त्या व्यक्तीने X या ठिकाणापासून कामास सुरुवात केल्यास व 5.5 किमी. अंतर पार केलेले असताना Y या ठिकाणी किती विटा पोहोचविल्या ?
- (A) 190
(B) 195
(C) 210
(D) 215
15. एका जंगलामध्ये चालू वर्षात 64 हरिणे आहेत. जर $x(n)$ ही संख्या त्या जंगलातील n व्या वर्षातील हरिणांची संख्या दर्शविते व $x(n) = \frac{3}{2}x(n-1)$, $n = 1, 2, 3, \dots$, असेल, तर 5व्या वर्षातील त्या जंगलातील हरिणांची संख्या किती ?
- (A) 96
(B) 486
(C) 243
(D) 339

16. Which of the following conclusion/s is/are valid based on the statements given below ?

Statement I : Some tigers are goats.

Statement II : All political leaders are intelligent.

Conclusion 1 : Some goats are not tigers.

Conclusion 2 : Some political leaders are intelligent.

Code :

- (A) 1 only
- (B) 2 only
- (C) 1 and 2 both
- (D) Neither 1 nor 2

17. Some buses are standing facing the bus stand. Thane bus was ahead of Nasik bus, which was ahead of Jalgaon bus. Amravati bus was behind Dhule bus, but ahead of Thane bus. Which is the second last bus from behind ?

- (A) Thane
- (B) Jalgaon
- (C) Nasik
- (D) Amravati

16. खालील विधानांच्या आधारे पुढीलपैकी कोणते/ता निष्कर्ष उचित आहेत ?

विधान I : काही वाघ हे बकरे आहेत.

विधान II : सर्व राजकीय नेते बुद्धिमान असतात.

निष्कर्ष 1 : काही बकरे वाघ नाहीत.

निष्कर्ष 2 : काही राजकीय नेते बुद्धिमान असतात.

कोड :

- (A) 1 फक्त
- (B) 2 फक्त
- (C) 1 आणि 2 दोन्हीही
- (D) 1 आणि 2 यापैकी नाही

17. काही बस बसथांब्यावर समोर तोंड करून उऱ्या आहेत. ठाण्याची बस नासिक बसच्या पुढे आहे आणि नासिकची बस जळगांव बसच्या पुढे आहे. अमरावती बस धुळे बसच्या मागे आहे परंतु ठाणे बसच्या पुढे आहे. तर मागून दोन नंबरची बस कोणती आहे ?

- (A) ठाणे
- (B) जळगांव
- (C) नासिक
- (D) अमरावती

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| <p>18. In a code language if JKLM is coded as OSVX, then how DEFG will be coded in the same language ?</p> <p>(A) ILNQ
(B) JLNP
(C) KMOR
(D) IMPR</p> <p>19. In a code language if DAC means 635, then what will be the code for FEG ?</p> <p>(A) 879
(B) 678
(C) 587
(D) 897</p> <p>20. While facing south, Virat walks 15 meters and then turns to his right and walks 10 meters. From there he turns to his right and walks 15 meters. Then he turns to his left and walks 15 meters. Which direction is he facing now and how much away from the starting point ?</p> <p>(A) East, 15 meters
(B) West, 25 meters
(C) North, 15 meters
(D) South, 40 meters</p> | <p>18. एका सांकेतिक भाषेत जर JKLM चे रूपांतर OSVX असे आहे. तर त्याच भाषेत DEFG चे रूपांतर काय असेल ?</p> <p>(A) ILNQ
(B) JLNP
(C) KMOR
(D) IMPR</p> <p>19. एका सांकेतिक भाषेत जर DAC चा संकेतांक 635 असा होतो, तर FEG चा संकेतांक काय असेल ?</p> <p>(A) 879
(B) 678
(C) 587
(D) 897</p> <p>20. दक्षिणेकडे तोंड करून विराट 15 मीटर चालतो आणि तो नंतर स्वतःच्या उजवीकडे वळून 10 मीटर चालतो. त्यानंतर तो उजवीकडे वळून 15 मीटर चालतो. नंतर तो डावीकडे वळून 15 मीटर चालतो. तर तो कोणत्या दिशेला तोंड करून आणि मूळ ठिकाणापासून किती अंतरावर उभा आहे ?</p> <p>(A) पूर्व, 15 मीटर
(B) पश्चिम, 25 मीटर
(C) उत्तर, 15 मीटर
(D) दक्षिण, 40 मीटर</p> |
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Directions :

Question numbers **21** and **22** are based on the following information :

Following is a table representing foreign tourists visiting different places in India in a certain year. (Figures are in lakhs).

Type Place	American	English	French	Other	Total
Agra	6.5	3.8	3.5	1.2	15.0
Delhi	8.2	8.7	2.7	0.4	20.0
Chennai	3.7	3.3	2.4	0.6	10.0
Udaipur	2.8	1.3	1.5	0.4	6.0
Bangalore	3.0	1.2	1.3	0.5	6.0
Shrinagar	1.0	0.8	1.1	0.1	3.0

21. What is percentage of total number of tourists visiting Agra ?
- (A) 33.33%
 - (B) 25.00%
 - (C) 16.67%
 - (D) 10.00%
22. Which type of tourists found maximum at Delhi ?
- (A) American
 - (B) English
 - (C) French
 - (D) Other

सूचना :

प्रश्न क्रमांक **21** आणि **22** पुढील माहितीवर आधारित आहेत :

भारतात ठराविक वर्षात विविध ठिकाणी भेटी देणाऱ्या परदेशी प्रवाशांची माहिती पुढील सारणीमध्ये दिलेली आहे (आकडे लाखामध्ये आहेत).

प्रकार ठिकाण	अमेरिकन	इंगिलश	फ्रेंच	इतर	एकूण
आग्रा	6.5	3.8	3.5	1.2	15.0
दिल्ली	8.2	8.7	2.7	0.4	20.0
चेन्ऱई	3.7	3.3	2.4	0.6	10.0
उदयपूर	2.8	1.3	1.5	0.4	6.0
बंगलोर	3.0	1.2	1.3	0.5	6.0
श्रीनगर	1.0	0.8	1.1	0.1	3.0

21. आग्रा शहरास भेट देणाऱ्या एकूण प्रवाशांची शेकडेवारी किती ?
- (A) 33.33%
 - (B) 25.00%
 - (C) 16.67%
 - (D) 10.00%
22. दिल्लीमध्ये कोणत्या प्रकारचे प्रवासी सर्वात जास्त आढळतात ?
- (A) अमेरिकन
 - (B) इंगिलश
 - (C) फ्रेंच
 - (D) इतर

Directions :

Question numbers **23** and **24** are based on the following information :

Following table gives itemwise expenditure of construction of house.

Item	Expenditure (%)
Labour	25
Cement and Bricks	30
Steel	15
Timber and Glass	20
Miscellaneous	10

23. The information in the above table is to be represented diagrammatically using Pie diagram. What will be the angle of the sector representing item labour ?
- (A) 50°
 (B) 30°
 (C) 90°
 (D) 25°
24. What is the ratio of expenditure of the item cement and bricks to the total expenditure of construction of house ?
- (A) $1 : 3$
 (B) $1 : 4$
 (C) $2 : 5$
 (D) $3 : 10$

सूचना :

प्रश्न क्रमांक **23** आणि **24** हे पुढील माहितीवर आधारित आहेत :

पुढील सारणी घरबांधणीचा विविध कलमां-प्रमाणे झालेला खर्च देत आहे.

कलम	खर्च (%)
मजुरी	25
सिमेंट आणि विटा	30
लोखंड	15
लाकूड आणि काच	20
अन्य	10

23. वरील सारणीमधील माहिती वर्तुळ चित्राच्या (Pie diagram) साहाय्याने दाखवायची आहे. मजुरी या कलमासाठी असणाऱ्या वर्तुळपाकळीचा (Sector) कोन किती अंशाचा असेल ?
- (A) 50°
 (B) 30°
 (C) 90°
 (D) 25°
24. सिमेंट आणि विटा या कलमासाठी झालेल्या खर्चाचे घराच्या बांधकामासाठी झालेल्या एकूण खर्चाशी गुणोत्तर काय आहे ?
- (A) $1 : 3$
 (B) $1 : 4$
 (C) $2 : 5$
 (D) $3 : 10$

25. The following (X, Y) points are plotted on X-Y plane and the adjacent points are joined by smooth curve :

X	Y
1	60
2	30
3	20
4	15
5	12

What will be the nature of curve ?

- (A) Straight line
 - (B) Parabola
 - (C) Hyperbola
 - (D) Exponential curve
26. Identify the correct pair from the following :
- (A) Pxl – unit of focus of digital cameras
 - (B) HDD – unit of high definition of digital screens
 - (C) Kbps – unit of data transfer rate
 - (D) Ghz – unit of memory storage on digital devices

25. पुढील (X, Y) बिंदू X-Y प्रतलावर रेखाटले व सलगचे बिंदू नितळ (smooth) वक्राने जोडले :

X	Y
1	60
2	30
3	20
4	15
5	12

या वक्राचे स्वरूप कोणते असेल ?

- (A) सरळ रेषा
 - (B) अन्वस्त (Parabola)
 - (C) अपास्त (Hyperbola)
 - (D) घातांकी वक्र (Exponential curve)
26. खालीलपैकी कोणती जोडी योग्य आहे ?
- (A) Pxl – डिजिटल कॅमेराचा फोकस मापनाचे एकक
 - (B) HDD – डिजिटल पडद्यांच्या उच्च स्पष्टतेचे (डेफिनेशन) एकक
 - (C) Kbps – विदा (डेटा) हस्तांतर वेगाचे एकक
 - (D) Ghz – डिजिटल उपकरणांमधील स्मृती साठवणुकीचे एकक

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| <p>27. When you access a site with 'https' instead of 'http' in the address bar, it primarily means :</p> <p>(A) You are accessing a speedy connection</p> <p>(B) You are accessing a secure communication</p> <p>(C) You are accessing a single date line transfer</p> <p>(D) You are accessing a smartphone friendly website</p> <p>28. Which of the following shows the correct chronological order of the first launch of these internet based facilities ?</p> <p>(A) YouTube, Gmail, Instagram, Wikipedia</p> <p>(B) Wikipedia, YouTube, Gmail, Instagram</p> <p>(C) Gmail, Wikipedia, YouTube, Instagram</p> <p>(D) Wikipedia, Gmail, YouTube, Instagram</p> | <p>27. 'http' ऐवजी 'https' अशी इंग्रजी अक्षरे अँडेसबारमध्ये असणारी वेबसाईट तुम्ही जेव्हा वापरता तेव्हा तुम्ही :</p> <p>(A) एक वेगवान इंटरनेट जुळणी (जोड) वापरत असता</p> <p>(B) एक सुरक्षित संपर्क जोड वापरत असता</p> <p>(C) विदा हस्तांतराचा एकच मार्ग वापरत असता</p> <p>(D) स्मार्टफोनशी अनुरूप वेबसाईट वापरत असता</p> <p>28. इंटरनेटवरील खालील डिजिटल सेवा सर्वप्रथम सुरु झाल्याचे वर्ष या निकषावर खालीलपैकी कोणता पर्याय योग्य कालानुक्रम दर्शवितो ?</p> <p>(A) युट्यूब, जीमेल, इन्स्टाग्राम, विकिपिडिया</p> <p>(B) विकिपिडिया, युट्यूब, जीमेल, इन्स्टाग्राम</p> <p>(C) जीमेल, विकिपिडिया, युट्यूब, इन्स्टाग्राम</p> <p>(D) विकिपिडिया, जीमेल, युट्यूब, इन्स्टाग्राम</p> |
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29. Which of the following has not been appointed as a national coordinator for SWAYAM to ensure the quality of the course content ?
- (A) Indian Institute of Science (IISc)
(B) National Institute of Open Schooling (NIOS)
(C) Indian Institute of Management, Bangalore (IIMB)
(D) Consortium for Educational Communication (CEC)
30. In the context of 'Web 2.0' digital environment what does the abbreviation UGC stand for ?
- (A) University Grants Commission
(B) User Generated Content
(C) Unique Graphic Coding
(D) Universal Graphic Chip-set
31. When were Millennium Development Goals (MDGs) adopted by the United Nations ?
- (A) 1990
(B) 1995
(C) 2000
(D) 2010
29. स्वयमवरील (SWAYAM) अभ्यासक्रमांच्या आशयाचा दर्जा राखण्यासाठी खालीलपैकी कोणत्या संस्थेची राष्ट्रीय समन्वयक म्हणून नियुक्ती झालेली नाही ?
- (A) भारतीय विज्ञान संस्थान (आयआयएससी)
(B) राष्ट्रीय मुक्त विद्यालक्षी शिक्षण संस्था (एनआयओएस)
(C) भारतीय व्यवस्थापन संस्था बंगळुरू (अयआयएमबी)
(D) शैक्षणिक संज्ञापन सहयोग (सीईसी)
30. 'वेब 2.0' डिजिटल व्यवस्थेच्या संदर्भात UGC या इंग्रजीतील लघुरूप खालीलपैकी कोणती (इंग्रजी) संज्ञा दर्शविते ?
- (A) युनिवर्सिटी ग्रॅंट्स कमिशन
(B) युजर जनरेटेड कॅटेन्ट
(C) युनिक ग्राफिक कोडिंग
(D) युनिवर्सल ग्राफिक चिप-सेट
31. संयुक्त राष्ट्रांनी सहस्राब्दी विकास उद्दिष्टे (MDGs) कधी स्वीकारली ?
- (A) 1990
(B) 1995
(C) 2000
(D) 2010

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| <p>32. What is the target year for achieving the Sustainable Development Goals ?</p> <p>(A) 2020
(B) 2025
(C) 2030
(D) 2040</p> <p>33. Which of the following is the effect of photochemical smog ?</p> <p>(A) Headaches, eyes, nose and throat irritation
(B) Gastrointestinal disorders
(C) Renal disorders
(D) Bone disorders</p> <p>34. What is the term for the process of inoculating microbes into soil ?</p> <p>(A) Bioventing
(B) Biostimulation
(C) Bioaugmentation
(D) Biosparaging</p> | <p>32. शाश्वत विकास उद्दिष्टे साध्य करण्यासाठी निर्धारित वर्ष कोणते ?</p> <p>(A) 2020
(B) 2025
(C) 2030
(D) 2040</p> <p>33. खालीलपैकी कोणता प्रकाशरासायनिक धुरव्याचा परिणाम आहे ?</p> <p>(A) डोकेदुखी, डोळे, नाक, घसा यांची जळजळ
(B) उदर आणि आतड्याचे विकार
(C) मूत्रपिंडाचे विकार
(D) हाडांचे विकार</p> <p>34. मातीमधे सूक्ष्मजीवांचे संरोपण करण्याच्या प्रक्रियेला काय म्हणतात ?</p> <p>(A) जैविक-निर्गमन
(B) जैविक-उत्तेजना
(C) सूक्ष्मजीव आवर्धित करणे
(D) जैविक शिडकावा करणे</p> |
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| <p>35. Which component of a solar panel is responsible for directly generating electric current when exposed to sunlight ?</p> <p>(A) Inverter
 (B) Semiconductor material
 (C) Reflectors
 (D) Batteries</p> <p>36. Environmental Education is not just awareness and knowledge, but it is also development of</p> <p>(A) Deeper knowledge
 (B) Theoretic knowledge
 (C) Proper attitude
 (D) Proper concepts</p> <p>37. Indian education system generally is divided into following periods :</p> <p>(A) Vedic period, Buddhist period, Muslim period, British period, Post-Independence period
 (B) Hindu period, Buddhist period, Jain period, Muslim period, British period
 (C) Vedic period, Ramayan period, Mahabharat period, Jain period, British period
 (D) Upanishadic period, Puranas period, Buddhist period, Muslim period, Modern period</p> | <p>35. सुर्यप्रकाशाच्या संपर्कात आल्यावर सौर पटलाचा कोणता घटक थेट विद्युत प्रवाह निर्माण करण्यास जबाबदार असतो ?</p> <p>(A) अखंड विद्युत पुरवठा यंत्र
 (B) अर्धसंवाहक सामग्री
 (C) परावर्तक
 (D) विजेरी संच</p> <p>36. पर्यावरण शिक्षण हे फक्त जाणीव जागृती व ज्ञान नव्हे, तर त्यामध्ये चा विकासही अभिप्रेत आहे.</p> <p>(A) सखोल ज्ञान
 (B) सैद्धान्तिक ज्ञान
 (C) योग्य अभिवृत्ती
 (D) योग्य संकल्पना</p> <p>37. भारतीय शिक्षण व्यवस्थेचे सामान्यतः खालील विभाग केले जातात :</p> <p>(A) वैदिक काळ, बौद्ध काळ, मुस्लिम काळ, ब्रिटिश काळ, स्वातंत्र्योत्तर काळ
 (B) हिंदू काळ, बौद्ध काळ, जैन काळ, मुस्लिम काळ, ब्रिटिश काळ
 (C) वैदिक काळ, रामायण काळ, महाभारत काळ, जैन काळ, ब्रिटीश काळ
 (D) उपनिषद काळ, पुराण काळ, बौद्ध काळ, मुस्लिम काळ, आधुनिक काळ</p> |
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| <p>38. In correspondence education system the following things are included :</p> <ul style="list-style-type: none"> (A) Only guiding instructions (B) Only solved answers through letters (C) Guiding instructions and solved answers (D) Guiding instructions, solved answers and occasional lectures <p>39. The First Open University was started in 1969 at</p> <ul style="list-style-type: none"> (A) Chicago in America (B) Milton Kenis in England (C) Paris in France (D) Delhi in India <p>40. According to Muslim System of Education, 'Madarsa' is supposed to be the centre of</p> <ul style="list-style-type: none"> (A) Primary Education (B) Secondary Education (C) Higher Education (D) Technical Education | <p>38. पत्रव्यवहाराद्वारे शिक्षण व्यवस्थेत खालील गोष्टींचा समावेश होतो :</p> <ul style="list-style-type: none"> (A) फक्त मार्गदर्शक सूचना (B) फक्त सोडविलेली उत्तरे (C) मार्गदर्शक सूचना आणि सोडविलेली उत्तरे (D) मार्गदर्शक सूचना, सोडविलेली उत्तरे आणि प्रासंगिक व्याख्याने <p>39. पहिल्या मुक्त विद्यापीठाची स्थापन 1969 मध्ये येथे स्थापन झाली.</p> <ul style="list-style-type: none"> (A) अमेरिकेतील शिकागो (B) इंग्लंडमधील मिल्टन कोनिस (C) फ्रान्समधील पैरिस (D) भारतातील दिल्ली <p>40. मुस्लिम शिक्षण पद्धतीनुसार 'मदरसा' हे केंद्र समजले जाते.</p> <ul style="list-style-type: none"> (A) प्राथमिक शिक्षण (B) माध्यमिक शिक्षण (C) उच्च शिक्षण (D) तांत्रिक शिक्षण |
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| <p>41. If taught on memory level of teaching, the students get tremendous power for acquisition of</p> <p>(i) factual information
 (ii) generalized insight
 (iii) problem solving abilities</p> <p>(A) Only (ii)
 (B) Only (i)
 (C) (i) and (ii)
 (D) (ii) and (iii)</p> <p>42. The teacher should choose teaching method considering</p> <p>(i) Nature of the learners
 (ii) Nature of the objectives to be realized
 (iii) The teacher's own ability and proficiency</p> <p>(A) Only (i)
 (B) (i) and (ii)
 (C) (i), (ii) and (iii)
 (D) Only (ii)</p> | <p>41. जर अध्यापनाच्या स्मृती (memory) स्तरावर शिकवले तर विद्यार्थ्यांना च्या संपादनासाठी विलक्षण शक्ती मिळेल.</p> <p>(i) वास्तविक माहिती
 (ii) सामान्यीकृत अंतर्दृष्टी
 (iii) समस्या निराकरण क्षमता</p> <p>(A) केवळ (ii)
 (B) केवळ (i)
 (C) (i) आणि (ii)
 (D) (ii) आणि (iii)</p> <p>42. विचारात घेऊन शिक्षकाने अध्यापन पद्धती निवडली पाहिजे.</p> <p>(i) अध्ययनकर्त्यांचे स्वरूप
 (ii) साध्य करावयाच्या उद्दिष्टांचे स्वरूप
 (iii) शिक्षकाच्या स्वतःच्या क्षमता आणि निपुणता</p> <p>(A) केवळ (i)
 (B) (i) आणि (ii)
 (C) (i), (ii) आणि (iii)
 (D) केवळ (ii)</p> |
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| <p>43. What is the main characteristic of gifted students ?</p> <p>(A) They are introvert in nature
 (B) They are dependent of their peers
 (C) They are extrovert in nature
 (D) They are independent in their judgement</p> <p>44. For adult learners, instruction needs to focus</p> <p>(A) equally on the process and the content to be taught
 (B) less on the process and more on the content to be taught
 (C) more on the process and less on the content to be taught
 (D) equally on the process and the product of learning</p> <p>45. evaluation gives a clear idea about understanding of the student regarding particular content.</p> <p>(A) Placement
 (B) Formative
 (C) Summative
 (D) Diagnostic</p> | <p>43. प्रतिभावंत विद्यार्थ्यांचे मुख्य वैशिष्ट्य काय असते ?</p> <p>(A) ते अंतर्मुख स्वरूपाचे असतात
 (B) ते त्यांच्या सहाध्यायांवर अवलंबून असतात
 (C) ते बहिर्मुख स्वरूपाचे असतात
 (D) ते त्यांच्या निर्णयामध्ये स्वतंत्र असतात</p> <p>44. प्रौढ अध्ययनकर्त्त्यांसाठी, अनुदेशनामध्ये भर देण्याची गरज असते.</p> <p>(A) प्रक्रिया आणि शिकवण्याचा आशय यांवर सारखाच
 (B) प्रक्रियेवर कमी आणि शिकवण्याच्या आशयावर जास्त
 (C) प्रक्रियेवर जास्त आणि शिकवण्याच्या आशयावर कमी
 (D) प्रक्रिया आणि अध्ययनाचा परिपाक (Product) यांवर सारखाच</p> <p>45. विद्यार्थ्यांच्या विशिष्ट आशयाच्या आकलना-बाबतची स्पष्ट कल्पना मूल्यापन देते.</p> <p>(A) स्थाननिश्चिती
 (B) आकारिक
 (C) साकारिक
 (D) नैदानिक</p> |
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46. is the characteristic of qualitative research.
- (A) Emphasis on numerical data
(B) Focus on statistical analysis
(C) In-depth exploration of meanings and experiences
(D) Strict adherence to experimental designs
47. is a limitation of positivism in research.
- (A) It ignores the importance of empirical evidence
(B) It tends to oversimplify complex social phenomenon
(C) It places too much emphasis on subjective interpretations
(D) It encourages bias and personal opinions in research

46. हे गुणात्मक संशोधनाचे वैशिष्ट्य आहे.
- (A) संख्यात्मक प्रदत्तावर (डेटावर) भर
(B) संख्याशास्त्रीय विश्लेषणावर लक्ष्य
(C) अर्थाचे आणि अनुभवांचे सखोल शोधन
(D) प्रायोगिक पद्धतीच्या आराखड्यास पक्के चिकटून राहाणे
47. ही सकारात्मक संशोधनाची मर्यादा आहे.
- (A) अनुभवजन्य पुराव्यांच्या महत्त्वाकडे दुर्लक्ष करणे
(B) अतिजटिल सामाजिक घटनेला जास्त सुगम करण्याची प्रवृत्ती
(C) व्यक्तिसापेक्ष अर्थनिर्वचन करण्यावर जास्त भर देणे
(D) संशोधनामध्ये पक्षपातीपणा आणि वैयक्तिक मते यांना प्रोत्साहन देणे

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| <p>48. is referred as “citation” in the academic writing.</p> <p>(A) A reference to the author’s personal experiences</p> <p>(B) A way of giving proper credit to the original source of information</p> <p>(C) A fictional element added to enhance the narrative</p> <p>(D) A personal opinion included without supporting evidence</p> | <p>48. याला शैक्षणिक लेखनामध्ये “उद्धरण” असे म्हणतात.</p> <p>(A) लेखकाच्या वैयक्तिक अनुभवांचा संदर्भ</p> <p>(B) माहितीच्या मूळ स्रोताला योग्य तो ऋणनिर्देश (क्रेडिट) देण्याचा मार्ग</p> <p>(C) कथन वाढविण्यासाठी जोडलेला एक काल्पनिक मार्ग</p> <p>(D) समर्थनार्थ पुराव्याशिवाय समाविष्ट केलेले वैयक्तिक मत</p> |
| <p>49. type of research misconduct involves making up or falsifying data.</p> <p>(A) Plagiarism</p> <p>(B) Fabrication</p> <p>(C) Misinterpretation</p> <p>(D) Biased sampling</p> | <p>49. प्रकारच्या संशोधन गैरवर्तनामध्ये फसवा डेटा तयार करणे किंवा खोटा डेटा तयार करणे समाविष्ट आहे.</p> <p>(A) साहित्यिक चोरी/वाड्मय चौर्य</p> <p>(B) बनावटपणा</p> <p>(C) चुकीचे अर्थनिर्वचन</p> <p>(D) पक्षपाती नमुना निवड</p> |
| <p>50. ICT tool is essential for creating and managing bibliographies in research papers.</p> <p>(A) Statistical software</p> <p>(B) Reference management software</p> <p>(C) Spreadsheet software</p> <p>(D) Project management software</p> | <p>50. शोधनिबंधामध्ये ग्रंथसूची तयार करण्यासाठी आणि तिचे व्यवस्थापन करण्यासाठी वापरले जाते.</p> <p>(A) सांख्यिकी सॉफ्टवेअर</p> <p>(B) संदर्भ व्यवस्थापन सॉफ्टवेअर</p> <p>(C) स्प्रेडशीट सॉफ्टवेअर</p> <p>(D) प्रकल्प व्यवस्थापन सॉफ्टवेअर</p> |

Paper I
प्रश्नपत्रिका I

Time Allowed : 60 Minutes]**[Maximum Marks : 100**

Note : This Paper contains **Fifty (50)** multiple choice questions, each question carrying **Two (2)** marks. Attempt *All* questions.

सूचना : या प्रश्नपत्रिकेते पन्नास (50) बहुनिवड प्रश्न दिलेले असून प्रत्येक प्रश्नाला दोन (2) गुण आहेत.
सर्व प्रश्न सोडवा.

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| <p>1. What is the arithmetic mean of the integers from 1 to 51 ?</p> <p>(A) 24
(B) 25
(C) 26
(D) 27</p> <p>2. If 10^m (m is positive integer) divides the product of the integers from 101 to 151, then the maximum value of m is :</p> <p>(A) 12
(B) 13
(C) 11
(D) 10</p> <p>3. Among the three numbers, $X = 188181811881$, $Y = 881181811818$ and $Z = 811881188118$ which numbers are divisible by 18 ?</p> <p>(A) X only
(B) Y and Z only
(C) Z only
(D) X, Y and Z</p> | <p>1. 1 ते 51 या पूर्णांक संख्यांची गणित मध्य किती ?</p> <p>(A) 24
(B) 25
(C) 26
(D) 27</p> <p>2. जर 10^m (m धन पूर्णांक आहे) या संख्येने 101 ते 151 या पूर्णांक संख्यांच्या गुणाकाराने निःशेष भाग जातो तर m ची मोठ्यात मोठी किंमत किती ?</p> <p>(A) 12
(B) 13
(C) 11
(D) 10</p> <p>3. दिलेल्या $X = 188181811881$, $Y = 881181811818$ व $Z = 811881188118$ संख्यापैकी कोणत्या संख्यांस 18 ने निःशेष भाग जातो ?</p> <p>(A) X फक्त
(B) Y व Z फक्त
(C) Z फक्त
(D) X, Y व Z</p> |
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4. A person was working to transfer bricks from a place X to a place Y, where the distance between X and Y is 200 meters. At a time the person was carrying 15 bricks. Starting from the place X, after travelling 5.5 km while working, how many bricks were shifted to the place Y by the person ?
- (A) 190
 (B) 195
 (C) 210
 (D) 215
5. There are 64 deer in a forest in the present year. If $x(n)$ denotes the number of deer in the forest in year n and that $x(n)=\frac{3}{2}x(n-1)$ for $n = 1, 2, 3, \dots$, how many deer are there in 5th year in the forest ?
- (A) 96
 (B) 486
 (C) 243
 (D) 339
4. एक व्यक्ती X या ठिकाणापासून Y या ठिकाणी विटा वाहून नेण्याचे काम करत आहे. X आणि Y या ठिकाणांमधील अंतर 200 मीटर आहे. ती व्यक्ती एका वेळेस 15 विटा वाहून नेते. त्या व्यक्तीने X या ठिकाणापासून कामास सुरुवात केल्यास व 5.5 किमी. अंतर पार केलेले असताना Y या ठिकाणी किती विटा पोहोचविल्या ?
- (A) 190
 (B) 195
 (C) 210
 (D) 215
5. एका जंगलामध्ये चालू वर्षात 64 हरिणे आहेत. जर $x(n)$ ही संख्या त्या जंगलातील n व्या वर्षातील हरिणांची संख्या दर्शविते व $x(n)=\frac{3}{2}x(n-1)$, $n = 1, 2, 3, \dots$, असेल, तर 5व्या वर्षातील त्या जंगलातील हरिणांची संख्या किती ?
- (A) 96
 (B) 486
 (C) 243
 (D) 339

6. Which of the following conclusion/s is/are valid based on the statements given below ?

Statement I : Some tigers are goats.

Statement II : All political leaders are intelligent.

Conclusion 1 : Some goats are not tigers.

Conclusion 2 : Some political leaders are intelligent.

Code :

- (A) 1 only
- (B) 2 only
- (C) 1 and 2 both
- (D) Neither 1 nor 2

7. Some buses are standing facing the bus stand. Thane bus was ahead of Nasik bus, which was ahead of Jalgaon bus. Amravati bus was behind Dhule bus, but ahead of Thane bus. Which is the second last bus from behind ?

- (A) Thane
- (B) Jalgaon
- (C) Nasik
- (D) Amravati

6. खालील विधानांच्या आधारे पुढीलपैकी कोणते/ता निष्कर्ष उचित आहेत ?

विधान I : काही वाघ हे बकरे आहेत.

विधान II : सर्व राजकीय नेते बुद्धिमान असतात.

निष्कर्ष 1 : काही बकरे वाघ नाहीत.

निष्कर्ष 2 : काही राजकीय नेते बुद्धिमान असतात.

कोड :

- (A) 1 फक्त
- (B) 2 फक्त
- (C) 1 आणि 2 दोन्हीही
- (D) 1 आणि 2 यापैकी नाही

7. काही बस बसथांब्यावर समोर तोंड करून उघ्या आहेत. ठाण्याची बस नासिक बसच्या पुढे आहे आणि नासिकची बस जळगांव बसच्या पुढे आहे. अमरावती बस धुळे बसच्या मागे आहे परंतु ठाणे बसच्या पुढे आहे. तर मागून दोन नंबरची बस कोणती आहे ?

- (A) ठाणे
- (B) जळगांव
- (C) नासिक
- (D) अमरावती

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| <p>8. In a code language if JKLM is coded as OSVX, then how DEFG will be coded in the same language ?</p> <p>(A) ILNQ
(B) JLNP
(C) KMOR
(D) IMPR</p> <p>9. In a code language if DAC means 635, then what will be the code for FEG ?</p> <p>(A) 879
(B) 678
(C) 587
(D) 897</p> <p>10. While facing south, Virat walks 15 meters and then turns to his right and walks 10 meters. From there he turns to his right and walks 15 meters. Then he turns to his left and walks 15 meters. Which direction is he facing now and how much away from the starting point ?</p> <p>(A) East, 15 meters
(B) West, 25 meters
(C) North, 15 meters
(D) South, 40 meters</p> | <p>8. एका सांकेतिक भाषेत जर JKLM चे रूपांतर OSVX असे आहे. तर त्याच भाषेत DEFG चे रूपांतर काय असेल ?</p> <p>(A) ILNQ
(B) JLNP
(C) KMOR
(D) IMPR</p> <p>9. एका सांकेतिक भाषेत जर DAC चा संकेतांक 635 असा होतो, तर FEG चा संकेतांक काय असेल ?</p> <p>(A) 879
(B) 678
(C) 587
(D) 897</p> <p>10. दक्षिणेकडे तोंड करून विराट 15 मीटर चालतो आणि तो नंतर स्वतःच्या उजवीकडे वळून 10 मीटर चालतो. त्यानंतर तो उजवीकडे वळून 15 मीटर चालतो. नंतर तो डावीकडे वळून 15 मीटर चालतो. तर तो कोणत्या दिशेला तोंड करून आणि मूळ ठिकाणापासून किती अंतरावर उभा आहे ?</p> <p>(A) पूर्व, 15 मीटर
(B) पश्चिम, 25 मीटर
(C) उत्तर, 15 मीटर
(D) दक्षिण, 40 मीटर</p> |
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Directions :

Question numbers **11** and **12** are based on the following information :

Following is a table representing foreign tourists visiting different places in India in a certain year. (Figures are in lakhs).

Type Place	American	English	French	Other	Total
Agra	6.5	3.8	3.5	1.2	15.0
Delhi	8.2	8.7	2.7	0.4	20.0
Chennai	3.7	3.3	2.4	0.6	10.0
Udaipur	2.8	1.3	1.5	0.4	6.0
Bangalore	3.0	1.2	1.3	0.5	6.0
Shrinagar	1.0	0.8	1.1	0.1	3.0

11. What is percentage of total number of tourists visiting Agra ?
 - (A) 33.33%
 - (B) 25.00%
 - (C) 16.67%
 - (D) 10.00%
12. Which type of tourists found maximum at Delhi ?
 - (A) American
 - (B) English
 - (C) French
 - (D) Other

सूचना :

प्रश्न क्रमांक **11** आणि **12** पुढील माहितीवर आधारित आहेत :

भारतात ठराविक वर्षात विविध ठिकाणी भेटी देणाऱ्या परदेशी प्रवाशांची माहिती पुढील सारणीमध्ये दिलेली आहे (आकडे लाखामध्ये आहेत).

प्रकार ठिकाण	अमेरिकन	इंगिलश	फ्रेंच	इतर	एकूण
आग्रा	6.5	3.8	3.5	1.2	15.0
दिल्ली	8.2	8.7	2.7	0.4	20.0
चेन्नई	3.7	3.3	2.4	0.6	10.0
उदयपूर	2.8	1.3	1.5	0.4	6.0
बंगलोर	3.0	1.2	1.3	0.5	6.0
श्रीनगर	1.0	0.8	1.1	0.1	3.0

11. आग्रा शहरास भेट देणाऱ्या एकूण प्रवाशांची शेकडेवारी किती ?
 - (A) 33.33%
 - (B) 25.00%
 - (C) 16.67%
 - (D) 10.00%
12. दिल्लीमध्ये कोणत्या प्रकारचे प्रवासी सर्वात जास्त आढळतात ?
 - (A) अमेरिकन
 - (B) इंगिलश
 - (C) फ्रेंच
 - (D) इतर

Directions :

Question numbers **13** and **14** are based on the following information :

Following table gives itemwise expenditure of construction of house.

Item	Expenditure (%)
Labour	25
Cement and Bricks	30
Steel	15
Timber and Glass	20
Miscellaneous	10

13. The information in the above table is to be represented diagrammatically using Pie diagram. What will be the angle of the sector representing item labour ?
- (A) 50°
 (B) 30°
 (C) 90°
 (D) 25°
14. What is the ratio of expenditure of the item cement and bricks to the total expenditure of construction of house ?
- (A) $1 : 3$
 (B) $1 : 4$
 (C) $2 : 5$
 (D) $3 : 10$

सूचना :

प्रश्न क्रमांक **13** आणि **14** हे पुढील माहितीवर आधारित आहेत :

पुढील सारणी घरबांधणीचा विविध कलमां-प्रमाणे झालेला खर्च देत आहे.

कलम	खर्च (%)
मजुरी	25
सिमेंट आणि विटा	30
लोखंड	15
लाकूड आणि काच	20
अन्य	10

13. वरील सारणीमधील माहिती वर्तुळ चित्राच्या (Pie diagram) साहाय्याने दाखवायची आहे. मजुरी या कलमासाठी असणाऱ्या वर्तुळपाकळीचा (Sector) कोन किती अंशाचा असेल ?
- (A) 50°
 (B) 30°
 (C) 90°
 (D) 25°
14. सिमेंट आणि विटा या कलमासाठी झालेल्या खर्चाचे घराच्या बांधकामासाठी झालेल्या एकूण खर्चाशी गुणोत्तर काय आहे ?
- (A) $1 : 3$
 (B) $1 : 4$
 (C) $2 : 5$
 (D) $3 : 10$

15. The following (X, Y) points are plotted on X-Y plane and the adjacent points are joined by smooth curve :

X	Y
1	60
2	30
3	20
4	15
5	12

What will be the nature of curve ?

- (A) Straight line
 - (B) Parabola
 - (C) Hyperbola
 - (D) Exponential curve
16. Identify the correct pair from the following :
- (A) Pxl – unit of focus of digital cameras
 - (B) HDD – unit of high definition of digital screens
 - (C) Kbps – unit of data transfer rate
 - (D) Ghz – unit of memory storage on digital devices

15. पुढील (X, Y) बिंदू X-Y प्रतलावर रेखाटले व सलगचे बिंदू नितळ (smooth) वक्राने जोडले :

X	Y
1	60
2	30
3	20
4	15
5	12

या वक्राचे स्वरूप कोणते असेल ?

- (A) सरळ रेषा
 - (B) अन्वस्त (Parabola)
 - (C) अपास्त (Hyperbola)
 - (D) घातांकी वक्र (Exponential curve)
16. खालीलपैकी कोणती जोडी योग्य आहे ?
- (A) Pxl – डिजिटल कॅमेराचा फोकस मापनाचे एकक
 - (B) HDD – डिजिटल पडवांच्या उच्च स्पष्टतेचे (डेफिनेशन) एकक
 - (C) Kbps – विदा (डेटा) हस्तांतर वेगाचे एकक
 - (D) Ghz – डिजिटल उपकरणांमधील स्मृती साठवणुकीचे एकक

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| <p>17. When you access a site with 'https' instead of 'http' in the address bar, it primarily means :</p> <p>(A) You are accessing a speedy connection</p> <p>(B) You are accessing a secure communication</p> <p>(C) You are accessing a single date line transfer</p> <p>(D) You are accessing a smartphone friendly website</p> <p>18. Which of the following shows the correct chronological order of the first launch of these internet based facilities ?</p> <p>(A) YouTube, Gmail, Instagram, Wikipedia</p> <p>(B) Wikipedia, YouTube, Gmail, Instagram</p> <p>(C) Gmail, Wikipedia, YouTube, Instagram</p> <p>(D) Wikipedia, Gmail, YouTube, Instagram</p> | <p>17. 'http' ऐवजी 'https' अशी इंग्रजी अक्षरे अँडेसबारमध्ये असणारी वेबसाईट तुम्ही जेव्हा वापरता तेव्हा तुम्ही :</p> <p>(A) एक वेगवान इंटरनेट जुळणी (जोड) वापरत असता</p> <p>(B) एक सुरक्षित संपर्क जोड वापरत असता</p> <p>(C) विदा हस्तांतराचा एकच मार्ग वापरत असता</p> <p>(D) स्मार्टफोनशी अनुरूप वेबसाईट वापरत असता</p> <p>18. इंटरनेटवरील खालील डिजिटल सेवा सर्वप्रथम सुरु झाल्याचे वर्ष या निकषावर खालीलपैकी कोणता पर्याय योग्य कालानुक्रम दर्शवितो ?</p> <p>(A) युट्यूब, जीमेल, इन्स्टाग्राम, विकिपिडिया</p> <p>(B) विकिपिडिया, युट्यूब, जीमेल, इन्स्टाग्राम</p> <p>(C) जीमेल, विकिपिडिया, युट्यूब, इन्स्टाग्राम</p> <p>(D) विकिपिडिया, जीमेल, युट्यूब, इन्स्टाग्राम</p> |
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| <p>19. Which of the following has not been appointed as a national coordinator for SWAYAM to ensure the quality of the course content ?</p> <p>(A) Indian Institute of Science (IISc)
(B) National Institute of Open Schooling (NIOS)
(C) Indian Institute of Management, Bangalore (IIMB)
(D) Consortium for Educational Communication (CEC)</p> <p>20. In the context of 'Web 2.0' digital environment what does the abbreviation UGC stand for ?</p> <p>(A) University Grants Commission
(B) User Generated Content
(C) Unique Graphic Coding
(D) Universal Graphic Chip-set</p> <p>21. When were Millennium Development Goals (MDGs) adopted by the United Nations ?</p> <p>(A) 1990
(B) 1995
(C) 2000
(D) 2010</p> | <p>19. स्वयमवरील (SWAYAM) अभ्यासक्रमांच्या आशयाचा दर्जा राखण्यासाठी खालीलपैकी कोणत्या संस्थेची राष्ट्रीय समन्वयक म्हणून नियुक्ती झालेली नाही ?</p> <p>(A) भारतीय विज्ञान संस्थान (आयआयएससी)
(B) राष्ट्रीय मुक्त विद्यालक्षी शिक्षण संस्था (एनआयओएस)
(C) भारतीय व्यवस्थापन संस्था बंगळुरू (आयआयएमबी)
(D) शैक्षणिक संज्ञापन सहयोग (सीईसी)</p> <p>20. 'वेब 2.0' डिजिटल व्यवस्थेच्या संदर्भात UGC या इंग्रजीतील लघुरूप खालीलपैकी कोणती (इंग्रजी) संज्ञा दर्शविते ?</p> <p>(A) युनिव्हर्सिटी ग्रॅंट्स कमिशन
(B) युजर जनरेटेड कंटेन्ट
(C) युनिक ग्राफिक कोडिंग
(D) युनिव्हर्सल ग्राफिक चिप-सेट</p> <p>21. संयुक्त राष्ट्रांनी सहस्राब्दी विकास उद्दिष्टे (MDGs) कधी स्वीकारली ?</p> <p>(A) 1990
(B) 1995
(C) 2000
(D) 2010</p> |
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| <p>22. What is the target year for achieving the Sustainable Development Goals ?</p> <p>(A) 2020
(B) 2025
(C) 2030
(D) 2040</p> <p>23. Which of the following is the effect of photochemical smog ?</p> <p>(A) Headaches, eyes, nose and throat irritation
(B) Gastrointestinal disorders
(C) Renal disorders
(D) Bone disorders</p> <p>24. What is the term for the process of inoculating microbes into soil ?</p> <p>(A) Bioventing
(B) Biostimulation
(C) Bioaugmentation
(D) Biosparaging</p> | <p>22. शाश्वत विकास उद्दिष्टे साध्य करण्यासाठी निर्धारित वर्ष कोणते ?</p> <p>(A) 2020
(B) 2025
(C) 2030
(D) 2040</p> <p>23. खालीलपैकी कोणता प्रकाशरासायनिक धुरव्याचा परिणाम आहे ?</p> <p>(A) डोकेदुखी, डोळे, नाक, घसा यांची जळजळ
(B) उदर आणि आतऱ्याचे विकार
(C) मूत्रपिंडाचे विकार
(D) हाडांचे विकार</p> <p>24. मातीमधे सूक्ष्मजीवांचे संरोपण करण्याच्या प्रक्रियेला काय म्हणतात ?</p> <p>(A) जैविक-निर्गमन
(B) जैविक-उत्तेजना
(C) सूक्ष्मजीव आवर्धित करणे
(D) जैविक शिडकावा करणे</p> |
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| <p>25. Which component of a solar panel is responsible for directly generating electric current when exposed to sunlight ?</p> <p>(A) Inverter
 (B) Semiconductor material
 (C) Reflectors
 (D) Batteries</p> <p>26. Environmental Education is not just awareness and knowledge, but it is also development of</p> <p>(A) Deeper knowledge
 (B) Theoretic knowledge
 (C) Proper attitude
 (D) Proper concepts</p> <p>27. Indian education system generally is divided into following periods :</p> <p>(A) Vedic period, Buddhist period, Muslim period, British period, Post-Independence period
 (B) Hindu period, Buddhist period, Jain period, Muslim period, British period
 (C) Vedic period, Ramayan period, Mahabharat period, Jain period, British period
 (D) Upanishadic period, Puranas period, Buddhist period, Muslim period, Modern period</p> | <p>25. सुर्यप्रकाशाच्या संपर्कात आल्यावर सौर पटलाचा कोणता घटक थेट विद्युत प्रवाह निर्माण करण्यास जबाबदार असतो ?</p> <p>(A) अखंड विद्युत पुरवठा यंत्र
 (B) अर्धसंवाहक सामग्री
 (C) परावर्तक
 (D) विजेरी संच</p> <p>26. पर्यावरण शिक्षण हे फक्त जाणीव जागृती व ज्ञान नव्हे, तर त्यामध्ये चा विकासही अभिप्रेत आहे.</p> <p>(A) सखोल ज्ञान
 (B) सैद्धान्तिक ज्ञान
 (C) योग्य अभिवृत्ती
 (D) योग्य संकल्पना</p> <p>27. भारतीय शिक्षण व्यवस्थेचे सामान्यतः खालील विभाग केले जातात :</p> <p>(A) वैदिक काळ, बौद्ध काळ, मुस्लिम काळ, ब्रिटिश काळ, स्वातंत्र्योत्तर काळ
 (B) हिंदू काळ, बौद्ध काळ, जैन काळ, मुस्लिम काळ, ब्रिटिश काळ
 (C) वैदिक काळ, रामायण काळ, महाभारत काळ, जैन काळ, ब्रिटीश काळ
 (D) उपनिषद काळ, पुराण काळ, बौद्ध काळ, मुस्लिम काळ, आधुनिक काळ</p> |
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| <p>28. In correspondence education system the following things are included :</p> <p>(A) Only guiding instructions</p> <p>(B) Only solved answers through letters</p> <p>(C) Guiding instructions and solved answers</p> <p>(D) Guiding instructions, solved answers and occasional lectures</p> <p>29. The First Open University was started in 1969 at</p> <p>(A) Chicago in America</p> <p>(B) Milton Kenis in England</p> <p>(C) Paris in France</p> <p>(D) Delhi in India</p> <p>30. According to Muslim System of Education, 'Madarsa' is supposed to be the centre of</p> <p>(A) Primary Education</p> <p>(B) Secondary Education</p> <p>(C) Higher Education</p> <p>(D) Technical Education</p> | <p>28. पत्रव्यवहाराद्वारे शिक्षण व्यवस्थेत खालील गोष्टींचा समावेश होतो :</p> <p>(A) फक्त मार्गदर्शक सूचना</p> <p>(B) फक्त सोडविलेली उत्तरे</p> <p>(C) मार्गदर्शक सूचना आणि सोडविलेली उत्तरे</p> <p>(D) मार्गदर्शक सूचना, सोडविलेली उत्तरे आणि प्रासंगिक व्याख्याने</p> <p>29. पहिल्या मुक्त विद्यापीठाची स्थापन 1969 मध्ये येथे स्थापन झाली.</p> <p>(A) अमेरिकेतील शिकागो</p> <p>(B) इंग्लंडमधील मिल्टन केनिस</p> <p>(C) फ्रान्समधील पैरिस</p> <p>(D) भारतातील दिल्ली</p> <p>30. मुस्लिम शिक्षण पद्धतीनुसार 'मदरसा' हे केंद्र समजले जाते.</p> <p>(A) प्राथमिक शिक्षण</p> <p>(B) माध्यमिक शिक्षण</p> <p>(C) उच्च शिक्षण</p> <p>(D) तांत्रिक शिक्षण</p> |
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| <p>31. If taught on memory level of teaching, the students get tremendous power for acquisition of</p> <p>(i) factual information
(ii) generalized insight
(iii) problem solving abilities</p> <p>(A) Only (ii)
(B) Only (i)
(C) (i) and (ii)
(D) (ii) and (iii)</p> | <p>31. जर अध्यापनाच्या स्मृती (memory) स्तरावर शिकवले तर विद्यार्थ्यांना च्या संपादनासाठी विलक्षण शक्ती मिळेल.</p> <p>(i) वास्तविक माहिती
(ii) सामान्यीकृत अंतर्दृष्टी
(iii) समस्या निराकरण क्षमता</p> <p>(A) केवळ (ii)
(B) केवळ (i)
(C) (i) आणि (ii)
(D) (ii) आणि (iii)</p> |
| <p>32. The teacher should choose teaching method considering</p> <p>(i) Nature of the learners
(ii) Nature of the objectives to be realized
(iii) The teacher's own ability and proficiency</p> <p>(A) Only (i)
(B) (i) and (ii)
(C) (i), (ii) and (iii)
(D) Only (ii)</p> | <p>32. विचारात घेऊन शिक्षकाने अध्यापन पद्धती निवडली पाहिजे.</p> <p>(i) अध्ययनकर्त्यांचे स्वरूप
(ii) साध्य करावयाच्या उद्दिष्टांचे स्वरूप
(iii) शिक्षकाच्या स्वतःच्या क्षमता आणि निपुणता</p> <p>(A) केवळ (i)
(B) (i) आणि (ii)
(C) (i), (ii) आणि (iii)
(D) केवळ (ii)</p> |

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| <p>33. What is the main characteristic of gifted students ?</p> <p>(A) They are introvert in nature
 (B) They are dependent of their peers
 (C) They are extrovert in nature
 (D) They are independent in their judgement</p> <p>34. For adult learners, instruction needs to focus</p> <p>(A) equally on the process and the content to be taught
 (B) less on the process and more on the content to be taught
 (C) more on the process and less on the content to be taught
 (D) equally on the process and the product of learning</p> <p>35. evaluation gives a clear idea about understanding of the student regarding particular content.</p> <p>(A) Placement
 (B) Formative
 (C) Summative
 (D) Diagnostic</p> | <p>33. प्रतिभावंत विद्यार्थ्यांचे मुख्य वैशिष्ट्य काय असते ?</p> <p>(A) ते अंतर्मुख स्वरूपाचे असतात
 (B) ते त्यांच्या सहाध्यायांवर अवलंबून असतात
 (C) ते बहिर्मुख स्वरूपाचे असतात
 (D) ते त्यांच्या निर्णयामध्ये स्वतंत्र असतात</p> <p>34. प्रौढ अध्ययनकर्त्त्यांसाठी, अनुदेशनामध्ये भर देण्याची गरज असते.</p> <p>(A) प्रक्रिया आणि शिकवण्याचा आशय यांवर सारखाच
 (B) प्रक्रियेवर कमी आणि शिकवण्याच्या आशयावर जास्त
 (C) प्रक्रियेवर जास्त आणि शिकवण्याच्या आशयावर कमी
 (D) प्रक्रिया आणि अध्ययनाचा परिपाक (Product) यांवर सारखाच</p> <p>35. विद्यार्थ्यांच्या विशिष्ट आशयाच्या आकलना-बाबतची स्पष्ट कल्पना मूल्यापन देते.</p> <p>(A) स्थाननिश्चिती
 (B) आकारिक
 (C) साकारिक
 (D) नैदानिक</p> |
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36. is the characteristic of qualitative research.
- (A) Emphasis on numerical data
(B) Focus on statistical analysis
(C) In-depth exploration of meanings and experiences
(D) Strict adherence to experimental designs
37. is a limitation of positivism in research.
- (A) It ignores the importance of empirical evidence
(B) It tends to oversimplify complex social phenomenon
(C) It places too much emphasis on subjective interpretations
(D) It encourages bias and personal opinions in research

36. हे गुणात्मक संशोधनाचे वैशिष्ट्य आहे.
- (A) संख्यात्मक प्रदत्तावर (डेटावर) भर
(B) संख्याशास्त्रीय विश्लेषणावर लक्ष्य
(C) अर्थाचे आणि अनुभवांचे सखोल शोधन
(D) प्रायोगिक पद्धतीच्या आराखड्यास पक्के चिकटून राहाणे
37. ही सकारात्मक संशोधनाची मर्यादा आहे.
- (A) अनुभवजन्य पुराव्यांच्या महत्त्वाकडे दुर्लक्ष करणे
(B) अतिजटिल सामाजिक घटनेला जास्त सुगम करण्याची प्रवृत्ती
(C) व्यक्तिसापेक्ष अर्थनिर्वचन करण्यावर जास्त भर देणे
(D) संशोधनामध्ये पक्षपातीपणा आणि वैयक्तिक मते यांना प्रोत्साहन देणे

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| <p>38. is referred as “citation” in the academic writing.</p> <p>(A) A reference to the author’s personal experiences</p> <p>(B) A way of giving proper credit to the original source of information</p> <p>(C) A fictional element added to enhance the narrative</p> <p>(D) A personal opinion included without supporting evidence</p> | <p>38. याला शैक्षणिक लेखनामध्ये “उद्धरण” असे म्हणतात.</p> <p>(A) लेखकाच्या वैयक्तिक अनुभवांचा संदर्भ</p> <p>(B) माहितीच्या मूळ स्रोताला योग्य तो ऋणनिर्देश (क्रेडिट) देण्याचा मार्ग</p> <p>(C) कथन वाढविण्यासाठी जोडलेला एक काल्पनिक मार्ग</p> <p>(D) समर्थनार्थ पुराव्याशिवाय समाविष्ट केलेले वैयक्तिक मत</p> |
| <p>39. type of research misconduct involves making up or falsifying data.</p> <p>(A) Plagiarism</p> <p>(B) Fabrication</p> <p>(C) Misinterpretation</p> <p>(D) Biased sampling</p> | <p>39. प्रकारच्या संशोधन गैरवर्तनामध्ये फसवा डेटा तयार करणे किंवा खोटा डेटा तयार करणे समाविष्ट आहे.</p> <p>(A) साहित्यिक चोरी/वाढ़मय चौर्य</p> <p>(B) बनावटपणा</p> <p>(C) चुकीचे अर्थनिर्वचन</p> <p>(D) पक्षपाती नमुना निवड</p> |
| <p>40. ICT tool is essential for creating and managing bibliographies in research papers.</p> <p>(A) Statistical software</p> <p>(B) Reference management software</p> <p>(C) Spreadsheet software</p> <p>(D) Project management software</p> | <p>40. शोधनिबंधामध्ये ग्रंथसूची तयार करण्यासाठी आणि तिचे व्यवस्थापन करण्यासाठी वापरले जाते.</p> <p>(A) सांख्यिकी सॉफ्टवेअर</p> <p>(B) संदर्भ व्यवस्थापन सॉफ्टवेअर</p> <p>(C) स्प्रेडशीट सॉफ्टवेअर</p> <p>(D) प्रकल्प व्यवस्थापन सॉफ्टवेअर</p> |

Directions :

Answer question Nos. 41 to 45 based on either English passage or Marathi passage :

It should be remembered that the Nationalist Movement in India, like all nationalist movements, was essentially a bourgeois movement. It represented the natural historical stage of development, and to consider it or to criticize it as a working class movement is wrong. Gandhi represented that movement, and the Indian masses in relation to that movement to a supreme degree, and he became the voice of Indian people to that extent. The main contribution of Gandhi to India and the Indian masses has been through the powerful movements that he launched through the National Congress. Through nation-wide action, he sought to mould the millions and largely succeeded in doing so. He changed them from a demoralized, timid, and hopeless mass, bullied and crushed by every dominant interest and incapable of resistance, to people with self-respect and self-reliance, resisting tyranny, and capable of united action and

सूचना :

प्रश्न क्रमांक 41 ते 45 हे पुढे दिलेल्या उताऱ्यावर आधारित आहेत. इंग्रजीतील किंवा मराठीतील उताऱ्यावरील प्रश्नांची उत्तरे द्या : भाषेचे क्रियाशील राजकारण महाराष्ट्रात घडले नाही. विश्वकोश, शब्दकोश, ग्रंथालय चळवळ इत्यादी घडामोडी शासनाच्या आश्रयाने तेवढ्या चालल्या. त्यापलीकडे समाजात मराठी भाषा, साहित्य, संस्कृती यांची चळवळ शून्यवत राहिली. जे विविध प्रयत्न होत राहिले, ते एकाकी अल्पजीवी किंवा अल्पशक्ती राहिले. आज सरकारविरुद्ध दंड थोपटून बंडाची भाषा करणाऱ्या साहित्य महामंडळाने, विविध साहित्य परिषदांनी, साहित्य संमेलनांनी मराठीसाठी कोणते संस्थात्मक, दीर्घ मुदतीचे विधायक राजकारण केले ? आपले भाषिक राजकारण गाववाल्या किंवा गटवाल्या पक्ख्याला अध्यक्ष करण्यासाठी संमेलन कोठे भरवायचे याच्या कारस्थानापासून सुरु होते आणि तिथेच थांबते. आपल्या साहित्यिक चळवळी कथाकथन आणि काव्यगायन यांच्यापुढे जाऊन साहित्यिक व तात्त्विक चर्चा मराठीतून सार्वजनिकपणे करण्याचा प्रयत्नही करीत नाहीत. मराठीच्या नावाने लेखनीच्या तलवारी करणारी वृत्तपत्रे

sacrifice for a larger cause. Gandhi made people think of political and economic issues, and every village and every bazaar hummed with arguments and debates on the new ideas and hopes that filled the people.

In case of very exceptional person, like Gandhi, the question of personality becomes especially important in order to understand and appraise him. To us, he represented the spirit and honour of India, the yearning of her sorrowing millions to be rid of their innumerable burdens. An insult to him by the British Government or others was an insult to India and her people.

41. The given passage states that Mahatma Gandhi largely succeeded in
- (A) fighting against the social discrimination in India
 - (B) eradicating economic inequalities in India
 - (C) moulding the millions in India
 - (D) giving political representation to Indians

गंभीर लेखांसाठी कधीमधी आठ पंधराशे शब्दांची जागा पुरवतात. पुस्तकपरीक्षणे तर दोनदोनशे शब्दांतच मागणारे बहादूर आपल्यात आहेत. सरकार-दरबारी सतत हात पसरून बसणारे प्रकाशक मराठीसाठी म्हणून काही प्रकाशित करायला तयार होतील का ? गंभीर लेखन, कोश वाड्मय अशा लेखनापासून प्रकाशक दूर का पळतात ? एकूणच भाषाप्रेम हा टाहे फोडण्याचा विषय न होता ती विधायक चळवळ होणे, हे भाषेचे एक पर्यायी राजकारण ठरू शकते. मराठीला नोबेल किंवा ज्ञानपीठ का मिळत नाही, असल्या गैरलागू चर्चापेक्षा केरळ शास्त्र साहित्य परिषदेप्रमाणे विज्ञान, भाषा आणि संस्कृती यांची एकवट करणारे राजकारण महाराष्ट्रात नाही, याची दखल घ्यायला हवी.

41. मराठी भाषा, साहित्य व संस्कृती यांची चळवळ शून्यवत राहिली असे लेखकाला का वाटते ?
- (A) व्यक्तींनी या क्षेत्रात स्वतःच्याच स्तरावर मौलिक कामगिरी केल्यामुळे
 - (B) मराठी भाषा, साहित्य व संस्कृती मुळातच भक्कम असल्यामुळे
 - (C) शासनाच्या आश्रयानेच राहण्याची वृत्ती आणि एकाकी प्रयत्नांमुळे
 - (D) पारस्पारिक वैमनस्यामुळे

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| <p>42. What do you understand by the phrase “to be rid of” ?</p> <p>(A) Released/freed from something
(B) Tied to something
(C) Increased something
(D) Included something</p> | <p>42. साहित्य महामंडळ, साहित्य परिषदा यांनी काय करणे अपेक्षित होते ?</p> <p>(A) गटातटाचे हितसंबंध न पाहता संस्थात्मक पातळीवर दीर्घ मुदतीचे विधायक भाषिक राजकारण करणे
(B) गाववाल्या किंवा गटवाल्या पळुयाला संमेलनाध्यक्ष म्हणून नाकारणे
(C) स्थानिक कारस्थानांना खतपाणी न घालणे
(D) समन्यायी पद्धतीने संमेलनाचा अध्यक्ष निवडणे</p> |
| <p>43. What did Mahatma Gandhi represent ?</p> <p>(A) Poverty of India
(B) Working class movement in India
(C) The natural historical stage of development of India
(D) The spirit and honour of India</p> | <p>43. मराठीतील साहित्यिक चळवळींनी कोणते कार्य करायला हवे होते ?</p> <p>(A) कथाकथन व काव्यगायनाचे गावोगावी उरुस भरवणे
(B) विरोधी विचारसरणीच्या साहित्यिकांना शह देणे
(C) साहित्यिक चळवळी सामान्यांपर्यंत पोहोचवणे
(D) मराठीची साहित्यिक व तात्त्विक चर्चा सार्वजनिक करणे</p> |
| <p>44. The main contribution of Gandhi to India has been</p> <p>(A) strong arguments
(B) the powerful movements
(C) vociferous speeches
(D) intermittent fasts</p> | <p>44. पुस्तकपरीक्षणे दोनशे शब्दांत मागणारे बहादूर कोण ?</p> <p>(A) प्रकाशक
(B) वृत्तपत्रांचे संपादक
(C) नियतकालिकांचे संपादक
(D) वृत्तपत्रांचे मालक</p> |

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| <p>45. What, do you think, is the correct meaning of the term “bourgeois” ?</p> <p>(A) Working class with utilitarian values</p> <p>(B) Agrarian class with moral values</p> <p>(C) Middle class with conventional, conservative and materialistic values</p> <p>(D) Lower class with no fixed values</p> <p>46. Which of the following messages is less likely to be misunderstood or misinterpreted due to cultural or linguistic background of the receivers of the message :</p> <p>(A) message full of written words</p> <p>(B) message full of spoken words</p> <p>(C) message full of body-gestures</p> <p>(D) message full of iconic signs</p> <p>47. In the context of contemporary digital parlance what are the following symbols collectively called as :</p> <p>: –) : – (; –) : – ×</p> <p>(A) Emoji</p> <p>(B) Emoticons</p> <p>(C) Smiley</p> <p>(D) Stickers</p> | <p>45. प्रस्तुत लेखातून लेखक मराठी भाषेबाबतची स्थितिगती मांडताना प्रामुख्याने काय सुचवू पाहत आहे ?</p> <p>(A) व्यक्ती व संस्थांनी शासनाचा आश्रय त्यागावा</p> <p>(B) साहित्यसंमेलनांची ठिकाणे व अध्यक्ष पारदर्शकपणे निवडावेत</p> <p>(C) भावनिक टाहो न फोडता विधायक चळवळीतून भाषेचे पर्यायी राजकारण करणे</p> <p>(D) प्रकाशक व संपादकांनी माय मराठीची सेवा करणे</p> <p>46. खालीलपैकी कोणत्या प्रकारच्या संदेशाचा स्वीकारकाकडून गैरअर्थ काढण्याची वा अभिप्रेत नसलेला अन्वयार्थ काढण्याची शक्यता कमी असते ?</p> <p>(A) संपूर्णपणे लेखी शब्द असलेला संदेश</p> <p>(B) संपूर्णपणे तोंडी (उच्चारित) शब्द असलेला संदेश</p> <p>(C) शारीरिक हावभावातून पूर्णपणे साकारलेला संदेश</p> <p>(D) पूर्णपणे अर्कप्रतिमा (आयकॉन) चिन्हांनी बनलेला संदेश</p> <p>47. समकालीन डिजिटल भाषाव्यवहारात खालील चिह्नसमूहांना इंग्रजीत सामायिकपणे काय म्हणून संबोधले जाते ?</p> <p>: –) : – (; –) : – ×</p> <p>(A) इमोजी</p> <p>(B) इमोटिकॉन्स</p> <p>(C) स्माईली</p> <p>(D) स्टीकर्स</p> |
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| <p>48. In the context of non-verbal communication identify the incorrect statement :</p> <ul style="list-style-type: none"> (A) Silence is a means of communication (B) Non-verbal cues and messages are easy to control (C) Non-verbal messages are culture sensitive and relative (D) In case of confusion, people tend to trust non-verbal communication more than the verbal <p>49. What is Prasar Bharati ?</p> <ul style="list-style-type: none"> (A) It is the national level news channel under Door Darshan (B) It is a news broadcasting service of All India Radio (AIR) (C) It is the association of private broadcasters in India (D) It is India's state owned Public Broadcaster <p>50. Which of the following elements is facilitated much more in a communicative situation wherein teacher and students are sitting together in a circular manner facing each other ?</p> <ul style="list-style-type: none"> (A) effectiveness of the content of teaching (B) teacher's power to control every student (C) discipline amongst the students (D) level of interactions between the students | <p>48. निःशब्द संज्ञापनाच्या संदर्भात खालीलपैकी कोणते विधान चूक ठरते ?</p> <ul style="list-style-type: none"> (A) मौन हे संज्ञापनाचे साधन आहे (B) निःशब्द संज्ञापनातील सुगावे आणि संदेश नियंत्रणासाठी सोपे असतात (C) निःशब्द संज्ञापन हे संस्कृतीसापेक्ष आणि संस्कृती संवेदनशील असते (D) गोंधळ किंवा द्विधा मनस्थितीत सशब्द संज्ञापनापेक्षा निःशब्द संज्ञापनावर विश्वास ठेवण्याकडे लोकांचा कल असतो <p>49. प्रसार भारती काय आहे ?</p> <ul style="list-style-type: none"> (A) दूरदर्शनाच्या अंतर्गत येणारी राष्ट्रीय स्तरावरची वृत्तवाहिनी (B) आकाशवाणीची (एआयआर) वृत्त प्रसारण सेवा (C) भारतातील खासगी प्रसारण सेवांची संघटना (D) भारताची शासकीय मालकीची सार्वजनिक प्रसारण सेवा <p>50. जेव्हा शिक्षक आणि विद्यार्थी एकमेकांकडे तोंड करून वर्तुळाकृती रचनेत बसलेले असतात, अशा संज्ञापन प्रसंगामध्ये खालीलपैकी कोणत्या घटकाला अधिक प्रमाणात उत्तेजन मिळते ?</p> <ul style="list-style-type: none"> (A) शिकविण्याच्या आशयाचे प्रभावीपण (B) प्रत्येक विद्यार्थ्यावर नियंत्रण ठेवण्याची शिक्षकांची क्षमता (C) विद्यार्थ्यांमधील शिस्त (D) विद्यार्थ्यांमधील आंतरसंवादाची पातळी |
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Paper I
प्रश्नपत्रिका I

Time Allowed : 60 Minutes]**[Maximum Marks : 100**

Note : This Paper contains **Fifty (50)** multiple choice questions, each question carrying **Two (2)** marks. Attempt *All* questions.

सूचना : या प्रश्नपत्रिकेते पन्नास (50) बहुनिवड प्रश्न दिलेले असून प्रत्येक प्रश्नाला दोन (2) गुण आहेत.
सर्व प्रश्न सोडवा.

Directions :

Question numbers **1** and **2** are based on the following information :

Following is a table representing foreign tourists visiting different places in India in a certain year. (Figures are in lakhs).

Type Place	American	English	French	Other	Total
Agra	6.5	3.8	3.5	1.2	15.0
Delhi	8.2	8.7	2.7	0.4	20.0
Chennai	3.7	3.3	2.4	0.6	10.0
Udaipur	2.8	1.3	1.5	0.4	6.0
Bangalore	3.0	1.2	1.3	0.5	6.0
Shrinagar	1.0	0.8	1.1	0.1	3.0

- What is percentage of total number of tourists visiting Agra ?
 (A) 33.33%
 (B) 25.00%
 (C) 16.67%
 (D) 10.00%

सूचना :

प्रश्न क्रमांक 1 आणि 2 पुढील माहितीवर आधारित आहेत :

भारतात ठराविक वर्षात विविध ठिकाणी भेटी देणाऱ्या परदेशी प्रवाशांची माहिती पुढील सारणीमध्ये दिलेली आहे (आकडे लाखामध्ये आहेत).

प्रकार ठिकाण	अमेरिकन	इंगिलिश	फ्रेंच	इतर	एकूण
आग्रा	6.5	3.8	3.5	1.2	15.0
दिल्ली	8.2	8.7	2.7	0.4	20.0
चेन्नई	3.7	3.3	2.4	0.6	10.0
उदयपूर	2.8	1.3	1.5	0.4	6.0
बंगलोर	3.0	1.2	1.3	0.5	6.0
श्रीनगर	1.0	0.8	1.1	0.1	3.0

- आग्रा शहरास भेट देणाऱ्या एकूण प्रवाशांची शेकडेवारी किती ?
 (A) 33.33%
 (B) 25.00%
 (C) 16.67%
 (D) 10.00%

2. Which type of tourists found maximum at Delhi ?
- American
 - English
 - French
 - Other
2. दिल्लीमध्ये कोणत्या प्रकारचे प्रवासी सर्वात जास्त आढळतात ?
- अमेरिकन
 - इंगिलश
 - फ्रेंच
 - इतर

Directions :

Question numbers 3 and 4 are based on the following information :

Following table gives itemwise expenditure of construction of house.

Item	Expenditure (%)
Labour	25
Cement and Bricks	30
Steel	15
Timber and Glass	20
Miscellaneous	10

3. The information in the above table is to be represented diagrammatically using Pie diagram. What will be the angle of the sector representing item labour ?
- 50°
 - 30°
 - 90°
 - 25°

सूचना :

प्रश्न क्रमांक 3 आणि 4 हे पुढील माहितीवर आधारित आहेत :

पुढील सारणी घरबांधणीचा विविध कलमां-प्रमाणे झालेला खर्च देत आहे.

कलम	खर्च (%)
मजुरी	25
सिमेंट आणि विटा	30
लोखंड	15
लाकूड आणि काच	20
अन्य	10

3. वरील सारणीमधील माहिती वर्तुळ चित्राच्या (Pie diagram) साहाय्याने दाखवायची आहे. मजुरी या कलमासाठी असणाऱ्या वर्तुळपाकळीचा (Sector) कोन किती अंशाचा असेल ?
- 50°
 - 30°
 - 90°
 - 25°

4. What is the ratio of expenditure of the item cement and bricks to the total expenditure of construction of house ?
- (A) 1 : 3
 (B) 1 : 4
 (C) 2 : 5
 (D) 3 : 10
5. The following (X, Y) points are plotted on X-Y plane and the adjacent points are joined by smooth curve :
- | X | Y |
|---|----|
| 1 | 60 |
| 2 | 30 |
| 3 | 20 |
| 4 | 15 |
| 5 | 12 |
- What will be the nature of curve ?
- (A) Straight line
 (B) Parabola
 (C) Hyperbola
 (D) Exponential curve
4. सिमेंट आणि विटा या कलमासाठी झालेल्या खर्चाचे घराच्या बांधकामासाठी झालेल्या एकूण खर्चाशी गुणोत्तर काय आहे ?
- (A) 1 : 3
 (B) 1 : 4
 (C) 2 : 5
 (D) 3 : 10
5. पुढील (X, Y) बिंदू X-Y प्रतलावर रेखाटले व सलगचे बिंदू नितळ (smooth) वक्राने जोडले :
- | X | Y |
|---|----|
| 1 | 60 |
| 2 | 30 |
| 3 | 20 |
| 4 | 15 |
| 5 | 12 |
- या वक्राचे स्वरूप कोणते असेल ?
- (A) सरळ रेषा
 (B) अन्वस्त (Parabola)
 (C) अपास्त (Hyperbola)
 (D) घातांकी वक्र (Exponential curve)

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| <p>6. Identify the correct pair from the following :</p> <p>(A) Pxl – unit of focus of digital cameras</p> <p>(B) HDD – unit of high definition of digital screens</p> <p>(C) Kbps – unit of data transfer rate</p> <p>(D) Ghz – unit of memory storage on digital devices</p> <p>7. When you access a site with ‘https’ instead of ‘http’ in the address bar, it primarily means :</p> <p>(A) You are accessing a speedy connection</p> <p>(B) You are accessing a secure communication</p> <p>(C) You are accessing a single date line transfer</p> <p>(D) You are accessing a smartphone friendly website</p> | <p>6. खालीलपैकी कोणती जोडी योग्य आहे ?</p> <p>(A) Pxl – डिजिटल कॅमेराचा फोकस मापनाचे एकक</p> <p>(B) HDD – डिजिटल पडद्यांच्या उच्च स्पष्टतेचे (डेफिनेशन) एकक</p> <p>(C) Kbps – विदा (डेटा) हस्तांतर वेगाचे एकक</p> <p>(D) Ghz – डिजिटल उपकरणांमधील स्मृती साठवणुकीचे एकक</p> <p>7. ‘http’ ऐवजी ‘https’ अशी इंग्रजी अक्षरे अँडेसबारमध्ये असणारी वेबसाईट तुम्ही जेव्हा वापरता तेव्हा तुम्ही :</p> <p>(A) एक वेगवान इंटरनेट जुळणी (जोड) वापरत असता</p> <p>(B) एक सुरक्षित संपर्क जोड वापरत असता</p> <p>(C) विदा हस्तांतराचा एकच मार्ग वापरत असता</p> <p>(D) स्मार्टफोनशी अनुरूप वेबसाईट वापरत असता</p> |
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8. Which of the following shows the correct chronological order of the first launch of these internet based facilities ?
- (A) YouTube, Gmail, Instagram, Wikipedia
(B) Wikipedia, YouTube, Gmail, Instagram
(C) Gmail, Wikipedia, YouTube, Instagram
(D) Wikipedia, Gmail, YouTube, Instagram
8. इंटरनेटवरील खालील डिजिटल सेवा सर्वप्रथम सुरु झाल्याचे वर्ष या निकषावर खालीलपैकी कोणता पर्याय योग्य कालानुक्रम दर्शवितो ?
- (A) युट्यूब, जीमेल, इन्स्टाग्राम, विकिपिडिया
(B) विकिपिडिया, युट्यूब, जीमेल, इन्स्टाग्राम
(C) जीमेल, विकिपिडिया, युट्यूब, इन्स्टाग्राम
(D) विकिपिडिया, जीमेल, युट्यूब, इन्स्टाग्राम
9. Which of the following has not been appointed as a national coordinator for SWAYAM to ensure the quality of the course content ?
- (A) Indian Institute of Science (IISc)
(B) National Institute of Open Schooling (NIOS)
(C) Indian Institute of Management, Bangalore (IIMB)
(D) Consortium for Educational Communication (CEC)
9. स्वयमवरील (SWAYAM) अभ्यासक्रमांच्या आशयाचा दर्जा राखण्यासाठी खालीलपैकी कोणत्या संस्थेची राष्ट्रीय समन्वयक म्हणून नियुक्ती झालेली नाही ?
- (A) भारतीय विज्ञान संस्थान (आयआयएससी)
(B) राष्ट्रीय मुक्त विद्यालक्षी शिक्षण संस्था (एनआयओएस)
(C) भारतीय व्यवस्थापन संस्था बंगळुरु (आयआयएमबी)
(D) शैक्षणिक संज्ञापन सहयोग (सीईसी)

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| <p>10. In the context of 'Web 2.0' digital environment what does the abbreviation UGC stand for ?</p> <p>(A) University Grants Commission
(B) User Generated Content
(C) Unique Graphic Coding
(D) Universal Graphic Chip-set</p> <p>11. When were Millennium Development Goals (MDGs) adopted by the United Nations ?</p> <p>(A) 1990
(B) 1995
(C) 2000
(D) 2010</p> <p>12. What is the target year for achieving the Sustainable Development Goals ?</p> <p>(A) 2020
(B) 2025
(C) 2030
(D) 2040</p> <p>13. Which of the following is the effect of photochemical smog ?</p> <p>(A) Headaches, eyes, nose and throat irritation
(B) Gastrointestinal disorders
(C) Renal disorders
(D) Bone disorders</p> | <p>10. 'वेब 2.0' डिजिटल व्यवस्थेच्या संदर्भात UGC या इंग्रजीतील लघुरूप खालीलपैकी कोणती (इंग्रजी) संज्ञा दर्शविते ?</p> <p>(A) युनिव्हर्सिटी ग्रॅंट्स कमिशन
(B) युजर जनरेटेड कंटेन्ट
(C) युनिक ग्राफिक कोडिंग
(D) युनिव्हर्सल ग्राफिक चिप-सेट</p> <p>11. संयुक्त राष्ट्रांनी सहस्राब्दी विकास उद्दिष्टे (MDGs) कधी स्वीकारली ?</p> <p>(A) 1990
(B) 1995
(C) 2000
(D) 2010</p> <p>12. शाश्वत विकास उद्दिष्टे साध्य करण्यासाठी निर्धारित वर्ष कोणते ?</p> <p>(A) 2020
(B) 2025
(C) 2030
(D) 2040</p> <p>13. खालीलपैकी कोणता प्रकाशरासायनिक धुरव्याचा परिणाम आहे ?</p> <p>(A) डोकेदुखी, डोळे, नाक, घसा यांची जळजळ
(B) उदर आणि आतऱ्याचे विकार
(C) मूत्रपिंडाचे विकार
(D) हाडांचे विकार</p> |
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| <p>14. What is the term for the process of inoculating microbes into soil ?</p> <p>(A) Bioventing
 (B) Biostimulation
 (C) Bioaugmentation
 (D) Biosparaging</p> <p>15. Which component of a solar panel is responsible for directly generating electric current when exposed to sunlight ?</p> <p>(A) Inverter
 (B) Semiconductor material
 (C) Reflectors
 (D) Batteries</p> <p>16. Environmental Education is not just awareness and knowledge, but it is also development of</p> <p>(A) Deeper knowledge
 (B) Theoretic knowledge
 (C) Proper attitude
 (D) Proper concepts</p> | <p>14. मातीमधे सूक्ष्मजीवांचे संरोपण करण्याच्या प्रक्रियेला काय म्हणतात ?</p> <p>(A) जैविक-निर्गमन
 (B) जैविक-उत्तेजना
 (C) सूक्ष्मजीव आवर्धित करणे
 (D) जैविक शिडकावा करणे</p> <p>15. सुर्यप्रकाशाच्या संपर्कात आल्यावर सौर पटलाचा कोणता घटक थेट विद्युत प्रवाह निर्माण करण्यास जबाबदार असतो ?</p> <p>(A) अखंड विद्युत पुरवठा यंत्र
 (B) अर्धसंवाहक सामग्री
 (C) परावर्तक
 (D) विजेरी संच</p> <p>16. पर्यावरण शिक्षण हे फक्त जाणीव जागृती व ज्ञान नव्हे, तर त्यामध्ये चा विकासही अभिप्रेत आहे.</p> <p>(A) सखोल ज्ञान
 (B) सैद्धान्तिक ज्ञान
 (C) योग्य अभिवृत्ती
 (D) योग्य संकल्पना</p> |
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| <p>17. Indian education system generally is divided into following periods :</p> <p>(A) Vedic period, Buddhist period, Muslim period, British period, Post-Independence period</p> <p>(B) Hindu period, Buddhist period, Jain period, Muslim period, British period</p> <p>(C) Vedic period, Ramayan period, Mahabharat period, Jain period, British period</p> <p>(D) Upanishadic period, Puranas period, Buddhist period, Muslim period, Modern period</p> <p>18. In correspondence education system the following things are included :</p> <p>(A) Only guiding instructions</p> <p>(B) Only solved answers through letters</p> <p>(C) Guiding instructions and solved answers</p> <p>(D) Guiding instructions, solved answers and occasional lectures</p> | <p>17. भारतीय शिक्षण व्यवस्थेचे सामान्यतः खालील विभाग केले जातात :</p> <p>(A) वैदिक काळ, बौद्ध काळ, मुस्लिम काळ, ब्रिटिश काळ, स्वातंत्र्योत्तर काळ</p> <p>(B) हिंदू काळ, बौद्ध काळ, जैन काळ, मुस्लिम काळ, ब्रिटिश काळ</p> <p>(C) वैदिक काळ, रामायण काळ, महाभारत काळ, जैन काळ, ब्रिटीश काळ</p> <p>(D) उपनिषद काळ, पुराण काळ, बौद्ध काळ, मुस्लिम काळ, आधुनिक काळ</p> <p>18. पत्रव्यवहाराद्वारे शिक्षण व्यवस्थेत खालील गोष्टींचा समावेश होतो :</p> <p>(A) फक्त मार्गदर्शक सूचना</p> <p>(B) फक्त सोडविलेली उत्तरे</p> <p>(C) मार्गदर्शक सूचना आणि सोडविलेली उत्तरे</p> <p>(D) मार्गदर्शक सूचना, सोडविलेली उत्तरे आणि प्रासंगिक व्याख्याने</p> |
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| <p>19. The First Open University was started in 1969 at</p> <p>(A) Chicago in America
 (B) Milton Kenis in England
 (C) Paris in France
 (D) Delhi in India</p> <p>20. According to Muslim System of Education, 'Madarsa' is supposed to be the centre of</p> <p>(A) Primary Education
 (B) Secondary Education
 (C) Higher Education
 (D) Technical Education</p> <p>21. If taught on memory level of teaching, the students get tremendous power for acquisition of</p> <p>(i) factual information
 (ii) generalized insight
 (iii) problem solving abilities</p> <p>(A) Only (ii)
 (B) Only (i)
 (C) (i) and (ii)
 (D) (ii) and (iii)</p> | <p>19. पहिल्या मुक्त विद्यापीठाची स्थापन 1969 मध्ये येथे स्थापन झाली.</p> <p>(A) अमेरिकेतील शिकागो
 (B) इंग्लंडमधील मिल्टन केनिस
 (C) फ्रान्समधील पैरिस
 (D) भारतातील दिल्ली</p> <p>20. मुस्लिम शिक्षण पद्धतीनुसार 'मदरसा' हे केंद्र समजले जाते.</p> <p>(A) प्राथमिक शिक्षण
 (B) माध्यमिक शिक्षण
 (C) उच्च शिक्षण
 (D) तांत्रिक शिक्षण</p> <p>21. जर अध्यापनाच्या स्मृती (memory) स्तरावर शिकवले तर विद्यार्थ्यांना च्या संपादनासाठी विलक्षण शक्ती मिळेल.</p> <p>(i) वास्तविक माहिती
 (ii) सामान्यीकृत अंतर्दृष्टी
 (iii) समस्या निराकरण क्षमता</p> <p>(A) केवळ (ii)
 (B) केवळ (i)
 (C) (i) आणि (ii)
 (D) (ii) आणि (iii)</p> |
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| <p>22. The teacher should choose teaching method considering</p> <ul style="list-style-type: none"> (i) Nature of the learners (ii) Nature of the objectives to be realized (iii) The teacher's own ability and proficiency <p>(A) Only (i)
 (B) (i) and (ii)
 (C) (i), (ii) and (iii)
 (D) Only (ii)</p> <p>23. What is the main characteristic of gifted students ?</p> <p>(A) They are introvert in nature
 (B) They are dependent of their peers
 (C) They are extrovert in nature
 (D) They are independent in their judgement</p> <p>24. For adult learners, instruction needs to focus</p> <p>(A) equally on the process and the content to be taught
 (B) less on the process and more on the content to be taught
 (C) more on the process and less on the content to be taught
 (D) equally on the process and the product of learning</p> | <p>22. विचारात घेऊन शिक्षकाने अध्यापन पद्धती निवडली पाहिजे.</p> <ul style="list-style-type: none"> (i) अध्ययनकर्त्यांचे स्वरूप (ii) साध्य करावयाच्या उद्दिष्टांचे स्वरूप (iii) शिक्षकाच्या स्वतःच्या क्षमता आणि निपुणता <p>(A) केवळ (i)
 (B) (i) आणि (ii)
 (C) (i), (ii) आणि (iii)
 (D) केवळ (ii)</p> <p>23. प्रतिभावंत विद्यार्थ्यांचे मुख्य वैशिष्ट्य काय असते ?</p> <p>(A) ते अंतर्मुख स्वरूपाचे असतात
 (B) ते त्यांच्या सहाध्यायांवर अवलंबून असतात
 (C) ते बहिर्मुख स्वरूपाचे असतात
 (D) ते त्यांच्या निर्णयामध्ये स्वतंत्र असतात</p> <p>24. प्रौढ अध्ययनकर्त्यांसाठी, अनुदेशनामध्ये भर देण्याची गरज असते.</p> <p>(A) प्रक्रिया आणि शिकवण्याचा आशय यांवर सारखाच
 (B) प्रक्रियेवर कमी आणि शिकवण्याच्या आशयावर जास्त
 (C) प्रक्रियेवर जास्त आणि शिकवण्याच्या आशयावर कमी
 (D) प्रक्रिया आणि अध्ययनाचा परिपाक (Product) यांवर सारखाच</p> |
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| <p>25. evaluation gives a clear idea about understanding of the student regarding particular content.</p> <p>(A) Placement
 (B) Formative
 (C) Summative
 (D) Diagnostic</p> | <p>25. विद्यार्थ्याच्या विशिष्ट आशयाच्या आकलनाबाबतची स्पष्ट कल्पना मूल्यापन देते.</p> <p>(A) स्थाननिश्चिती
 (B) आकारिक
 (C) साकारिक
 (D) नैदानिक</p> |
| <p>26. is the characteristic of qualitative research.</p> <p>(A) Emphasis on numerical data
 (B) Focus on statistical analysis
 (C) In-depth exploration of meanings and experiences
 (D) Strict adherence to experimental designs</p> | <p>26. हे गुणात्मक संशोधनाचे वैशिष्ट्य आहे.</p> <p>(A) संख्यात्मक प्रदत्तावर (डेटावर) भर
 (B) संख्याशास्त्रीय विश्लेषणावर लक्ष्य
 (C) अर्थाचे आणि अनुभवांचे सखोल शोधन
 (D) प्रायोगिक पद्धतीच्या आराखड्यास पक्के चिकटून राहाणे</p> |
| <p>27. is a limitation of positivism in research.</p> <p>(A) It ignores the importance of empirical evidence
 (B) It tends to oversimplify complex social phenomenon
 (C) It places too much emphasis on subjective interpretations
 (D) It encourages bias and personal opinions in research</p> | <p>27. ही सकारात्मक संशोधनाची मर्यादा आहे.</p> <p>(A) अनुभवजन्य पुराव्यांच्या महत्त्वाकडे दुर्लक्ष करणे
 (B) अतिजटिल सामाजिक घटनेला जास्त सुगम करण्याची प्रवृत्ती
 (C) व्यक्तिसापेक्ष अर्थनिर्वचन करण्यावर जास्त भर देणे
 (D) संशोधनामध्ये पक्षपातीपणा आणि वैयक्तिक मते यांना प्रोत्साहन देणे</p> |

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| <p>28. is referred as “citation” in the academic writing.</p> <p>(A) A reference to the author’s personal experiences</p> <p>(B) A way of giving proper credit to the original source of information</p> <p>(C) A fictional element added to enhance the narrative</p> <p>(D) A personal opinion included without supporting evidence</p> | <p>28. याला शैक्षणिक लेखनामध्ये “उद्धरण” असे म्हणतात.</p> <p>(A) लेखकाच्या वैयक्तिक अनुभवांचा संदर्भ</p> <p>(B) माहितीच्या मूळ स्रोताला योग्य तो ऋणनिर्देश (क्रेडिट) देण्याचा मार्ग</p> <p>(C) कथन वाढविण्यासाठी जोडलेला एक काल्पनिक मार्ग</p> <p>(D) समर्थनार्थ पुराव्याशिवाय समाविष्ट केलेले वैयक्तिक मत</p> |
| <p>29. type of research misconduct involves making up or falsifying data.</p> <p>(A) Plagiarism</p> <p>(B) Fabrication</p> <p>(C) Misinterpretation</p> <p>(D) Biased sampling</p> | <p>29. प्रकारच्या संशोधन गैरवर्तनामध्ये फसवा डेटा तयार करणे किंवा खोटा डेटा तयार करणे समाविष्ट आहे.</p> <p>(A) साहित्यिक चोरी/वाड्मय चौर्य</p> <p>(B) बनावटपणा</p> <p>(C) चुकीचे अर्थनिर्वचन</p> <p>(D) पक्षपाती नमुना निवड</p> |
| <p>30. ICT tool is essential for creating and managing bibliographies in research papers.</p> <p>(A) Statistical software</p> <p>(B) Reference management software</p> <p>(C) Spreadsheet software</p> <p>(D) Project management software</p> | <p>30. शोधनिबंधामध्ये ग्रंथसूची तयार करण्यासाठी आणि तिचे व्यवस्थापन करण्यासाठी वापरले जाते.</p> <p>(A) सांख्यिकी सॉफ्टवेअर</p> <p>(B) संदर्भ व्यवस्थापन सॉफ्टवेअर</p> <p>(C) स्प्रेडशीट सॉफ्टवेअर</p> <p>(D) प्रकल्प व्यवस्थापन सॉफ्टवेअर</p> |

Directions :

Answer question Nos. 31 to 35 based on either English passage or Marathi passage :

It should be remembered that the Nationalist Movement in India, like all nationalist movements, was essentially a bourgeois movement. It represented the natural historical stage of development, and to consider it or to criticize it as a working class movement is wrong. Gandhi represented that movement, and the Indian masses in relation to that movement to a supreme degree, and he became the voice of Indian people to that extent. The main contribution of Gandhi to India and the Indian masses has been through the powerful movements that he launched through the National Congress. Through nation-wide action, he sought to mould the millions and largely succeeded in doing so. He changed them from a

सूचना :

प्रश्न क्रमांक 31 ते 35 हे पुढे दिलेल्या उताऱ्यावर आधारित आहेत. इंग्रजीतील किंवा मराठीतील उताऱ्यावरील प्रश्नांची उत्तरे द्या : भाषेचे क्रियाशील राजकारण महाराष्ट्रात घडले नाही. विश्वकोश, शब्दकोश, ग्रंथालय चळवळ इत्यादी घडामोडी शासनाच्या आश्रयाने तेवढ्या चालल्या. त्यापलीकडे समाजात मराठी भाषा, साहित्य, संस्कृती यांची चळवळ शून्यवत राहिली. जे विविध प्रयत्न होत राहिले, ते एकाकी अल्पजीवी किंवा अल्पशक्ती राहिले. आज सरकारविरुद्ध दंड थोपटून बंडाची भाषा करणाऱ्या साहित्य महामंडळाने, विविध साहित्य परिषदांनी, साहित्य संमेलनांनी मराठीसाठी कोणते संस्थात्मक, दीर्घ मुदतीचे विधायक राजकारण केले ? आपले भाषिक राजकारण गाववाल्या किंवा गटवाल्या पक्ख्याला अध्यक्ष करण्यासाठी संमेलन कोठे भरवायचे याच्या कारस्थानापासून सुरु होते आणि तिथेच थांबते. आपल्या

demoralized, timid, and hopeless mass, bullied and crushed by every dominant interest and incapable of resistance, to people with self-respect and self-reliance, resisting tyranny, and capable of united action and sacrifice for a larger cause. Gandhi made people think of political and economic issues, and every village and every bazaar hummed with arguments and debates on the new ideas and hopes that filled the people.

In case of very exceptional person, like Gandhi, the question of personality becomes especially important in order to understand and appraise him. To us, he represented the spirit and honour of India, the yearning of her sorrowing millions to be rid of their innumerable burdens. An insult to him by the British Government or others was an insult to India and her people.

साहित्यिक चळवळी कथाकथन आणि काव्यगायन यांच्यापुढे जाऊन साहित्यिक व तात्त्विक चर्चा मराठीतून सार्वजनिकपणे करण्याचा प्रयत्नही करीत नाहीत. मराठीच्या नावाने लेखनीच्या तलवारी करणारी वृत्तपत्रे गंभीर लेखांसाठी कधीमधी आठ पंधराशे शब्दांची जागा पुरवतात. पुस्तकपरीक्षणे तर दोनदोनशे शब्दांतच मागणारे बहादुर आपल्यात आहेत. सरकार-दरबारी सतत हात पसरून बसणारे प्रकाशक मराठीसाठी म्हणून काही प्रकाशित करायला तयार होतील का ? गंभीर लेखन, कोश वाड्मय अशा लेखनापासून प्रकाशक दूर का पळतात ? एकूणच भाषाप्रेम हा टाहो फोडण्याचा विषय न होता ती विधायक चळवळ होणे, हे भाषेचे एक पर्यायी राजकारण ठरू शकते. मराठीला नोबेल किंवा ज्ञानपीठ का मिळत नाही, असल्या गैरलागू चर्चापेक्षा केरळ शास्त्र साहित्य परिषदेप्रमाणे विज्ञान, भाषा आणि संस्कृती यांची एकवट करणारे राजकारण महाराष्ट्रात नाही, याची दखल घ्यायला हवी.

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| <p>31. The given passage states that Mahatma Gandhi largely succeeded in</p> <p>(A) fighting against the social discrimination in India
 (B) eradicating economic inequalities in India
 (C) moulding the millions in India
 (D) giving political representation to Indians</p> <p>32. What do you understand by the phrase “to be rid of” ?</p> <p>(A) Released/freed from something
 (B) Tied to something
 (C) Increased something
 (D) Included something</p> <p>33. What did Mahatma Gandhi represent ?</p> <p>(A) Poverty of India
 (B) Working class movement in India
 (C) The natural historical stage of development of India
 (D) The spirit and honour of India</p> | <p>31. मराठी भाषा, साहित्य व संस्कृती यांची चळवळ शून्यवत राहिली असे लेखकाला का वाटते ?</p> <p>(A) व्यक्तींनी या क्षेत्रात स्वतःच्याच स्तरावर मौलिक कामगिरी केल्यामुळे
 (B) मराठी भाषा, साहित्य व संस्कृती मुळातच भक्कम असल्यामुळे
 (C) शासनाच्या आश्रयानेच राहण्याची वृत्ती आणि एकाकी प्रयत्नामुळे
 (D) पारस्पारिक वैमनस्यामुळे</p> <p>32. साहित्य महामंडळ, साहित्य परिषदा यांनी काय करणे अपेक्षित होते ?</p> <p>(A) गटातटाचे हितसंबंध न पाहता संस्थात्मक पातळीवर दोर्घ मुदतीचे विधायक भाषिक राजकारण करणे
 (B) गाववाल्या किंवा गटवाल्या पळ्याला संमेलनाध्यक्ष म्हणून नाकारणे
 (C) स्थानिक कारस्थानांना खतपाणी न घालणे
 (D) समन्यायी पद्धतीने संमेलनाचा अध्यक्ष निवडणे</p> <p>33. मराठीतील साहित्यिक चळवळींनी कोणते कार्य करायला हवे होते ?</p> <p>(A) कथाकथन व काव्यगायनाचे गावोगावी उरुस भरवणे
 (B) विरोधी विचारसरणीच्या साहित्यिकांना शह देणे
 (C) साहित्यिक चळवळी सामान्यांपर्यंत पोहोचवणे
 (D) मराठीची साहित्यिक व तात्त्विक चर्चा सार्वजनिक करणे</p> |
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| <p>34. The main contribution of Gandhi to India has been</p> <p>(A) strong arguments
 (B) the powerful movements
 (C) vociferous speeches
 (D) intermittent fasts</p> <p>35. What, do you think, is the correct meaning of the term “bourgeois” ?</p> <p>(A) Working class with utilitarian values
 (B) Agrarian class with moral values
 (C) Middle class with conventional, conservative and materialistic values
 (D) Lower class with no fixed values</p> <p>36. Which of the following messages is less likely to be misunderstood or misinterpreted due to cultural or linguistic background of the receivers of the message :</p> <p>(A) message full of written words
 (B) message full of spoken words
 (C) message full of body-gestures
 (D) message full of iconic signs</p> | <p>34. पुस्तकपरीक्षणे दोनशे शब्दांत मागणारे बहादूर कोण ?</p> <p>(A) प्रकाशक
 (B) वृत्तपत्रांचे संपादक
 (C) नियतकालिकांचे संपादक
 (D) वृत्तपत्रांचे मालक</p> <p>35. प्रस्तुत लेखातून लेखक मराठी भाषेबाबतची स्थितिगती मांडताना प्रामुख्याने काय सुचवू पाहत आहे ?</p> <p>(A) व्यक्ती व संस्थांनी शासनाचा आश्रय त्यागावा
 (B) साहित्यसंमेलनांची ठिकाणे व अध्यक्ष पारदर्शकपणे निवडावेत
 (C) भावनिक टाहो न फोडता विधायक चळवळीतून भाषेचे पर्यायी राजकारण करणे
 (D) प्रकाशक व संपादकांनी माय मराठीची सेवा करणे</p> <p>36. खालीलपैकी कोणत्या प्रकारच्या संदेशाचा स्वीकारकाकडून गैरअर्थ काढण्याची वा अभिप्रेत नसलेला अन्वयार्थ काढण्याची शक्यता कमी असते ?</p> <p>(A) संपूर्णपणे लेखी शब्द असलेला संदेश
 (B) संपूर्णपणे तोंडी (उच्चारित) शब्द असलेला संदेश
 (C) शारीरिक हावभावातून पूर्णपणे साकारलेला संदेश
 (D) पूर्णपणे अर्कप्रतिमा (आयकॉन) चिन्हांनी बनलेला संदेश</p> |
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| <p>37. In the context of contemporary digital parlance what are the following symbols collectively called as :</p> <p>: –) : – (; –) : – ×</p> <p>(A) Emoji
 (B) Emoticons
 (C) Smiley
 (D) Stickers</p> <p>38. In the context of non-verbal communication identify the incorrect statement :</p> <p>(A) Silence is a means of communication
 (B) Non-verbal cues and messages are easy to control
 (C) Non-verbal messages are culture sensitive and relative
 (D) In case of confusion, people tend to trust non-verbal communication more than the verbal</p> <p>39. What is Prasar Bharati ?</p> <p>(A) It is the national level news channel under Door Darshan
 (B) It is a news broadcasting service of All India Radio (AIR)
 (C) It is the association of private broadcasters in India
 (D) It is India's state owned Public Broadcaster</p> | <p>37. समकालीन डिजिटल भाषाव्यवहारात खालील चिह्नसमूहांना इंग्रजीत सामायिकपणे काय म्हणून संबोधले जाते ?</p> <p>: –) : – (; –) : – ×</p> <p>(A) इमोजी
 (B) इमोटिकॉन्स
 (C) स्माईली
 (D) स्टीकर्स</p> <p>38. निःशब्द संज्ञापनाच्या संदर्भात खालीलपैकी कोणते विधान चूक ठरते ?</p> <p>(A) मौन हे संज्ञापनाचे साधन आहे
 (B) निःशब्द संज्ञापनातील सुगावे आणि संदेश नियंत्रणासाठी सोपे असतात
 (C) निःशब्द संज्ञापन हे संस्कृतीसापेक्ष आणि संस्कृती संवेदनशील असते
 (D) गोंधळ किंवा द्विधा मनस्थितीत सशब्द संज्ञापनापेक्षा निःशब्द संज्ञापनावर विश्वास ठेवण्याकडे लोकांचा कल असते</p> <p>39. प्रसार भारती काय आहे ?</p> <p>(A) दूरदर्शनाच्या अंतर्गत येणारी राष्ट्रीय स्तरावरची वृत्तवाहिनी
 (B) आकाशवाणीची (एआयआर) वृत्त प्रसारण सेवा
 (C) भारतातील खासगी प्रसारण सेवांची संघटना
 (D) भारताची शासकीय मालकीची सार्वजनिक प्रसारण सेवा</p> |
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| <p>40. Which of the following elements is facilitated much more in a communicative situation wherein teacher and students are sitting together in a circular manner facing each other ?</p> <p>(A) effectiveness of the content of teaching
 (B) teacher's power to control every student
 (C) discipline amongst the students
 (D) level of interactions between the students</p> <p>41. What is the arithmetic mean of the integers from 1 to 51 ?</p> <p>(A) 24
 (B) 25
 (C) 26
 (D) 27</p> <p>42. If 10^m (m is positive integer) divides the product of the integers from 101 to 151, then the maximum value of m is :</p> <p>(A) 12
 (B) 13
 (C) 11
 (D) 10</p> | <p>40. जेव्हा शिक्षक आणि विद्यार्थी एकमेकांकडे तोंड करून वर्तुळाकृती रचनेत बसलेले असतात, अशा संज्ञापन प्रसंगामध्ये खालीलपैकी कोणत्या घटकाला अधिक प्रमाणात उत्तेजन मिळते ?</p> <p>(A) शिकविण्याच्या आशयाचे प्रभावीपण
 (B) प्रत्येक विद्यार्थ्यावर नियंत्रण ठेवण्याची शिक्षकांची क्षमता
 (C) विद्यार्थ्यांमधील शिस्त
 (D) विद्यार्थ्यांमधील आंतरसंवादाची पातळी</p> <p>41. 1 ते 51 या पूर्णांक संख्यांची गणित मध्य किती ?</p> <p>(A) 24
 (B) 25
 (C) 26
 (D) 27</p> <p>42. जर 10^m (m धन पूर्णांक आहे) या संख्येने 101 ते 151 या पूर्णांक संख्यांच्या गुणाकाराने निःशेष भाग जातो तर m ची मोठ्यात मोठी किंमत किती ?</p> <p>(A) 12
 (B) 13
 (C) 11
 (D) 10</p> |
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| <p>43. Among the three numbers, $X = 188181811881$, $Y = 881181811818$ and $Z = 811881188118$ which numbers are divisible by 18 ?</p> <p>(A) X only
 (B) Y and Z only
 (C) Z only
 (D) X, Y and Z</p> | <p>43. दिलेल्या $X = 188181811881$, $Y = 881181811818$ व $Z = 811881188118$ संख्यापैकी कोणत्या संख्यांस 18 ने निःशेष भाग जातो ?</p> <p>(A) X फक्त
 (B) Y व Z फक्त
 (C) Z फक्त
 (D) X, Y व Z</p> |
| <p>44. A person was working to transfer bricks from a place X to a place Y, where the distance between X and Y is 200 meters. At a time the person was carrying 15 bricks. Starting from the place X, after travelling 5.5 km while working, how many bricks were shifted to the place Y by the person ?</p> <p>(A) 190
 (B) 195
 (C) 210
 (D) 215</p> | <p>44. एक व्यक्ती X या ठिकाणापासून Y या ठिकाणी विटा वाहून नेण्याचे काम करत आहे. X आणि Y या ठिकाणांमधील अंतर 200 मीटर आहे. ती व्यक्ती एका वेळेस 15 विटा वाहून नेते. त्या व्यक्तीने X या ठिकाणापासून कामास सुरुवात केल्यास व 5.5 किमी. अंतर पार केलेले असताना Y या ठिकाणी किती विटा पोहोचविल्या ?</p> <p>(A) 190
 (B) 195
 (C) 210
 (D) 215</p> |
| <p>45. There are 64 deer in a forest in the present year. If $x(n)$ denotes the number of deer in the forest in year n and that $x(n) = \frac{3}{2}x(n-1)$ for $n = 1, 2, 3, \dots$, how many deer are there in 5th year in the forest ?</p> <p>(A) 96
 (B) 486
 (C) 243
 (D) 339</p> | <p>45. एका जंगलामध्ये चालू वर्षात 64 हरिणे आहेत. जर $x(n)$ ही संख्या त्या जंगलातील nव्या वर्षातील हरिणांची संख्या दर्शविते व $x(n) = \frac{3}{2}x(n-1)$, $n = 1, 2, 3, \dots$, असेल, तर 5व्या वर्षातील त्या जंगलातील हरिणांची संख्या किती ?</p> <p>(A) 96
 (B) 486
 (C) 243
 (D) 339</p> |

46. Which of the following conclusion/s is/are valid based on the statements given below ?

Statement I : Some tigers are goats.

Statement II : All political leaders are intelligent.

Conclusion 1 : Some goats are not tigers.

Conclusion 2 : Some political leaders are intelligent.

Code :

- (A) 1 only
- (B) 2 only
- (C) 1 and 2 both
- (D) Neither 1 nor 2

47. Some buses are standing facing the bus stand. Thane bus was ahead of Nasik bus, which was ahead of Jalgaon bus. Amravati bus was behind Dhule bus, but ahead of Thane bus. Which is the second last bus from behind ?

- (A) Thane
- (B) Jalgaon
- (C) Nasik
- (D) Amravati

46. खालील विधानांच्या आधारे पुढीलपैकी कोणते/ता निष्कर्ष उचित आहेत ?

विधान I : काही वाघ हे बकरे आहेत.

विधान II : सर्व राजकीय नेते बुद्धिमान असतात.

निष्कर्ष 1 : काही बकरे वाघ नाहीत.

निष्कर्ष 2 : काही राजकीय नेते बुद्धिमान असतात.

कोड :

- (A) 1 फक्त
- (B) 2 फक्त
- (C) 1 आणि 2 दोन्हीही
- (D) 1 आणि 2 यापैकी नाही

47. काही बस बसथांब्यावर समोर तोंड करून उऱ्या आहेत. ठाण्याची बस नासिक बसच्या पुढे आहे आणि नासिकची बस जळगांव बसच्या पुढे आहे. अमरावती बस धुळे बसच्या मागे आहे परंतु ठाणे बसच्या पुढे आहे. तर मागून दोन नंबरची बस कोणती आहे ?

- (A) ठाणे
- (B) जळगांव
- (C) नासिक
- (D) अमरावती

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| <p>48. In a code language if JKLM is coded as OSVX, then how DEFG will be coded in the same language ?</p> <p>(A) ILNQ
(B) JLNP
(C) KMOR
(D) IMPR</p> <p>49. In a code language if DAC means 635, then what will be the code for FEG ?</p> <p>(A) 879
(B) 678
(C) 587
(D) 897</p> <p>50. While facing south, Virat walks 15 meters and then turns to his right and walks 10 meters. From there he turns to his right and walks 15 meters. Then he turns to his left and walks 15 meters. Which direction is he facing now and how much away from the starting point ?</p> <p>(A) East, 15 meters
(B) West, 25 meters
(C) North, 15 meters
(D) South, 40 meters</p> | <p>48. एका सांकेतिक भाषेत जर JKLM चे रूपांतर OSVX असे आहे. तर त्याच भाषेत DEFG चे रूपांतर काय असेल ?</p> <p>(A) ILNQ
(B) JLNP
(C) KMOR
(D) IMPR</p> <p>49. एका सांकेतिक भाषेत जर DAC चा संकेतांक 635 असा होतो, तर FEG चा संकेतांक काय असेल ?</p> <p>(A) 879
(B) 678
(C) 587
(D) 897</p> <p>50. दक्षिणेकडे तोंड करून विराट 15 मीटर चालतो आणि तो नंतर स्वतःच्या उजवीकडे वळून 10 मीटर चालतो. त्यानंतर तो उजवीकडे वळून 15 मीटर चालतो. नंतर तो डावीकडे वळून 15 मीटर चालतो. तर तो कोणत्या दिशेला तोंड करून आणि मूळ ठिकाणापासून किती अंतरावर उभा आहे ?</p> <p>(A) पूर्व, 15 मीटर
(B) पश्चिम, 25 मीटर
(C) उत्तर, 15 मीटर
(D) दक्षिण, 40 मीटर</p> |
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Computer Science and Applications

Paper II

Time Allowed : 120 Minutes]

[Maximum Marks : 200

Note : This paper contains **Hundred (100)** multiple choice questions. Each question carrying **Two (2)** marks. Attempt *All* questions.

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| <p>1. The inference rule deals exclusively with formulas in conjunctive normal forms is called as :</p> <p>(A) Resolution rule
(B) Contingency rule
(C) Unsatisfiability rule
(D) Contradiction rule</p> <p>2. Let A and B be the sets. The symmetric difference between A and B is :</p> <p>(A) $A \oplus B = (A - B) \cup (B - A)$
(B) $A \cup B = (A \oplus B) \cap (B + A)$
(C) $A \cap B = (B + A) - (B - A)$
(D) $A \subseteq B = (A - B) \cup (B + A)$</p> | <p>3. A deck of playing cards contains 52 cards, 4 each with face values in the set {A, 2, 3, 4, 5, 6, 7, 8, 9, 10, J, Q, K}. Let us define face values of the top and bottom cards as X and Y. The shuffling algorithm is defined as follows :</p> <p>Sh1 : Permute the cards randomly due to that each arrangement occurs with probability $1/52$!</p> <p>Sh2 : If $X \neq Y$, flip the biased coin that comes up heads with probability P and go back to Sh1 if heads turns up otherwise stop.</p> <p>Each coin flip and each permutation is assumed to be independent of all the other randomization. What value of P will make X and Y independent random variables once this process of shuffling will stops ?</p> <p>(A) $P = 1/4$
(B) $P = 2/3$
(C) $P = 1/3$
(D) $P = 1/5$</p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
-

4. Identify the number of distinct string of length 2 of the combinations of blue and yellow beads. The both ends of the strings are not marked due to this they are indistinguishable if interchanging the ends of one will results other. Denote b and y as a blue and yellow beads. Let us consider bb , by , yb and yy are the four different strings of length 2 when equivalence between strings is not taken into the consideration. The number of equivalent classes into which the set $s = (bb, by, yb, yy)$ is divided by equivalent relation induced by the group of permutation $[\{\Pi_1, \Pi_2\}, 0]$ where :

$$\Pi_1 = \begin{pmatrix} bb & by & yb & yy \\ bb & by & yb & yy \end{pmatrix}$$

$$\Pi_2 = \begin{pmatrix} bb & by & yb & yy \\ bb & yb & by & yy \end{pmatrix}$$

- (A) 3
- (B) 4
- (C) 5
- (D) 6

5. Design a K-Map for $F(x, y, z) = x\bar{z} + xyz + y\bar{z}$ of $F(x, y, z)$ and find prime implicants.

- (A) $xy, y\bar{z}, x\bar{z}$
- (B) x, y, z
- (C) $\bar{x}y, yz, x\bar{z}$
- (D) $x\bar{y}, yz, \bar{x}z$

6. 11 students plan to have dinner together for multiple days. They will be seated at the round table. Their plan is to ensure that each student sits next to different neighbours at every dinner. How many days can this arrangement be sustained ?

- (A) 5
- (B) 11
- (C) 4
- (D) 7

7. Explore all 5 letter combinations formed using the letters a through h . How many of these words contains no repeats, also do not include the subword “bad” ?
- (A) 6660
 (B) 6667
 (C) 6578
 (D) 6312
8. Suppose G is the graph with n vertices such that every vertex having degree 5. What is the smallest value of n for which graph might be planar ?
- (A) $\frac{5n}{2}$
 (B) $5n$
 (C) $2n$
 (D) $\frac{2n}{5}$
9. Let us consider the full Coca-Cola bottles, 7 half-full and 7 empty. You want to divide the 21 bottles among three persons so that each will receive exactly 7. Moreover, each person must receive the same quantity of Coca-Cola. Solve the problem using Integer Linear programming and find a solution.
- What will be the objective function ?
- (A) There will be a dummy objective function with all zero coefficients.
- | Status | Number of bottles assigned to person | | |
|-----------|--------------------------------------|---|---|
| | 1 | 2 | 3 |
| Full | 1 | 3 | 3 |
| Half-full | 5 | 1 | 1 |
| Empty | 1 | 3 | 3 |

- (B) Objective function will be maximize the total quantity of Coca-Cola distribution.

Status	Number of bottles assigned to person		
	1	2	3
Full	3	1	2
Half-full	2	1	3
Empty	2	5	1

- (C) Objective function will be minimize the empty bottles.

Status	Number of bottles assigned to person		
	1	2	3
Full	0	1	2
Half-full	0	1	3
Empty	7	5	2

- (D) Set of a binary variable is represented for full bottle representation.

Status	Number of bottles assigned to person		
	1	2	3
Full	1	5	2
Half-full	2	1	2
Empty	4	1	3

10. Consider the following linear programming problem :

$$\text{Maximize } Z = 2x_1 + 3x_2$$

$$\text{Subject to : } x_1 + 3x_2 \leq 12$$

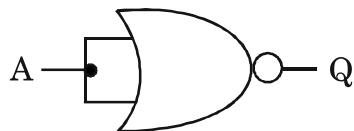
$$3x_1 + 2x_2 \leq 12$$

$$x_1, x_2 \geq 0$$

At which points of graphical solution space the infeasible basic optimum solutions are represented ?

- (A) Corner points ($x_1 = 0, x_2 = 6$) and ($x_1 = 12, x_2 = 0$) are infeasible
- (B) Corner points ($x_1 = 10.29, x_2 = 2$) and ($x_1 = 0, x_2 = 3.34$) are infeasible
- (C) Corner points ($x_1 = 12.20, x_2 = 6$) and ($x_1 = 0, x_2 = 5.24$) are infeasible
- (D) None of the corner points are infeasible

11. Given Logic Gate represents which of the following Truth Table ?



(A)

A	Q
0	0
1	0

(B)

A	Q
0	1
1	1

(C)

A	Q
0	0
1	1

(D)

A	Q
0	1
1	0

12. “100” is a number in Decimal Number System. What will be its representation in Octal Number System ?

- (A) 100
- (B) 144
- (C) 414
- (D) 441

13. The following Truth Table represents which Logical Micro-operation ?

A	B	F
0	0	0
0	1	1
1	0	1
1	1	0

- (A) $F \leftarrow A \wedge B$
- (B) $F \leftarrow \overline{A \wedge B}$
- (C) $F \leftarrow A \oplus B$
- (D) $F \leftarrow \overline{A \oplus B}$

14. Which of the following is not expected from a clock pulse in CPU ?

- (A) It is not applied to all registers.
- (B) It changes the state of registers as per control signal requirements.
- (C) It allows synchronization of various activities.
- (D) It may trigger the loading of data into registers or the transfer of data between registers.

15. Which of the following task is performed by Direct Memory Access (DMA) in a computer system ?
- (A) allow data transfer between a storage unit and CPU independent of memory
 - (B) allow data transfer between a storage unit and main memory independent of CPU
 - (C) allow data transfer between a storage unit and main memory under CPU control
 - (D) allow data transfer between CPU and main memory independent of a storage unit
16. Which of the following statements is not true with respect to a Hardwired Control Unit in comparison with a Micro-programmed Control Unit ?
- (A) It does not require control memory
 - (B) It provides better execution speed
 - (C) It enables a simpler control unit design
 - (D) It does not allow for flexible control unit design
17. Stack Pointer Register (SP) in x86 architecture is generally used to
- (A) point base of the stack
 - (B) point top of the stack
 - (C) point top or based of the stack based on opcode
 - (D) point top or based of the stack based on addressing mode
18. Which of the following computer systems is represented when a computer can process several programs at the same time ?
- (A) Single Instruction Stream, Single Data Stream (SISD)
 - (B) Single Instruction Stream, Multiple Data Stream (SIMD)
 - (C) Multiple Instruction Stream, Single Data Stream (MISD)
 - (D) Multiple Instruction Stream, Multiple Data Stream (MIMD)

19. Which Redundant Array of Independent Disks (RAID) technology maintains copy of an entire hard disk on other hard disk ?
- (A) RAID 0
(B) RAID 1
(C) RAID 5
(D) RAID 10
20. Which type of memory allows computer system to execute computer programs requiring more memory than physically available ?
- (A) Auxiliary Memory
(B) Associative Memory
(C) Cache Memory
(D) Virtual Memory
21. What is the difference between a “shallow copy” and a “deep copy” in the context of programming languages ?
- (A) Shallow copy duplicates only references, while deep copy duplicates entire object
(B) Shallow copy duplicates entire object, while deep copy duplicates only references
(C) Shallow copy duplicates only system variables, whereas deep copy duplicated user defined variables
(D) Shallow copy duplicates only user defined variables, whereas deep copy duplicated system variables

22. The term “snapshot” is used in the context of virtualization to refer to

- (A) Backup of virtual machine’s current state
- (B) Backup of host operating system’s current state
- (C) Backup of guest operating system’s current state
- (D) Backup of guest applications current state

23. Predict the output of the following source code in C language :

```
int main( )
{
    int i, x[5];
    for(i=0; i<5; i++) * (x+i) = i;
    for(i=0; i<5; i++) printf("%d", x[i]);
    return 0;
}
```

- (A) 0 1 2 3 4
- (B) Syntax Error
- (C) Semantic Error
- (D) Garbage Value

24. Predict the output of the following

C source code :

```
int x = 10;
```

```
int main( )
```

```
{
```

```
    int x = 20;
```

```
{
```

```
    int x = 30;
```

```
{extern x; printf("%d", x);}
```

```
}
```

```
return 0;
```

```
}
```

(A) 10

(B) 20

(C) 30

(D) 10 20 30

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25. class C {
public:
 void f(int a) {cout << a;}
 void f(int a, int b) {cout << a+b;}
 void f(int a, int b, int c) {cout
 << a+b+c;}
};
int main()
{
 C obj;
 obj.f(10);
 obj.f(10, 20);
 obj.f(10, 20, 30);
 return 0;
}

The above C++ source code exemplifies which of the following principle with respect to object-oriented programming ?

- (A) Abstraction
- (B) Encapsulation
- (C) Inheritance
- (D) Polymorphism

26. Predict the output of this source code written in C++ language :

```
class C1{  
public:  
    void display() {cout<<"Hello";}  
};  
class C2; public C1{  
public:  
    void display() {cout<<"World";}  
};  
int main(void) {  
    C1*ptr = new C2;  
    ptr->display();  
    return 0;  
}  
(A) Hello  
(B) World  
(C) Hello World  
(D) World Hello
```

27. Which of the following activities is not an application of XML ?

- (A) Data storage
- (B) Data transmission
- (C) Multiple rendering of the same data
- (D) Interaction with the user to get the data

28. Which of the following statements is not true with respect to Applets ?
- (A) All web browsers support Applets
 - (B) Applets are vulnerable from security perspective
 - (C) Applets can communicate with their server on their own
 - (D) Applets can play multimedia on client side
29. A transformation that distorts the shape of an object such that the transformed shape appears as if the object was composed of internal layers that had been caused to slide over each other is called as
- (A) Reflection
 - (B) Shear
 - (C) Dither
 - (D) Translation
30. Which of the following materials has highest spectacular reflection coefficient at an angle of 45° of incidence over it ?
- (A) Water
 - (B) Glass
 - (C) Gold
 - (D) Silver
31. Which of the following commands is used to save any transaction permanently into the database ?
- (A) Redo
 - (B) Commit
 - (C) Rollback
 - (D) Undo
32. The maximum number of children that a B-tree of order m can have :
- (A) $m + 1$
 - (B) $m - 1$
 - (C) m
 - (D) $2m$
33. Which of the following commands can be used SQL to delete all the records in the table work ?
- (A) Delete from work
 - (B) Delete from work where Id = 'Null'
 - (C) Remove table work
 - (D) Drop table work

34. A database is :
- (A) an organized collection of data or information that can be only accessed
 - (B) an organized collection of data or information that can be only managed
 - (C) an organized collection of data or information that can be accessed, updated and managed
 - (D) an organized collection of data or information that cannot be updated
35. The data contained in the data warehouse is described by :
- (A) Relational data
 - (B) Meta data
 - (C) Operational data
 - (D) Active data
36. An advantage of distributed database over a centralized database :
- (A) Modular growth
 - (B) Software cost
 - (C) Software complexity
 - (D) Slow response
37. In the context of functional dependency, Armstrong inference rules refer to :
- (A) Reflexivity, Decomposition and Transitivity
 - (B) Decomposition and Transitivity
 - (C) Transitivity, Augmentation and Reflexivity
 - (D) Decomposition and Reflexivity
38. For the SQL query given below :
- ```
SELECT employee_name
FROM employee
WHERE salary BETWEEN 70000
and 130000
```
- Select the equivalent in SQL without BETWEEN operator :
- (A) SELECT employee\_name  
FROM employee  
WHERE salary > 70000 and  
salary < 130000
  - (B) SELECT employee\_name  
FROM employee  
WHERE salary = 70000 and  
salary = 130000
  - (C) SELECT employee\_name  
FROM employee  
WHERE salary >= 70000 and  
salary <= 130000
  - (D) SELECT employee\_name  
FROM employee  
WHERE salary < 70000 and  
salary > 130000

39. A transaction enters into its partially committed state :
- When it finishes the execution of final statement
  - When it starts the execution of first statement
  - After writing ‘COMMIT’ into log
  - It never enters partially committed state
40. Consider the relation scheme (M, N, O, P, Q, R) with the following set of functional dependencies :
- $$F = \{MO \rightarrow PQ, MPR \rightarrow NO\}$$
- Which of the following is the trivial functional dependencies in  $F^+$ , where  $F^+$  is closure of F ?
- $MO \rightarrow PQ$
  - $MO \rightarrow OP$
  - $MP \rightarrow P$
  - $MPR \rightarrow N$
41. In what tree, for every node the height of its left subtree and right subtree differ at least by one :
- AVL tree
  - Threaded binary tree
  - Binary search tree
  - Complete tree
42. An example of a distributed OS is :
- Amoeba
  - UNIX
  - MS-DOS
  - MULTICS

43. Consider the following proposed solution to dining philosopher’s problem to avoid deadlock. Consider the binary semaphore lock initialized to 1.

Philosopher (int i)

```
{
 while (1)
 { think ();
 wait (lock);(i)
 wait (fork [i]);
 wait (fork [(i+1)%5]);
 signal (lock); (ii)
 eat();
 wait (lock); (iii)
 signal (fork [i]);
 signal (fork (i + 1) % 5);
 signal (lock); (iv)
 }
}
```

Which of the following is correct ?

- Removing (i) and (ii) will not affect the code. The code will work fine.
- Removing (iii) and (iv) will not affect the code. The code will work fine.
- Removing (i), (ii), (iii), (iv) will not affect the code. The code will work fine.
- All (i), (ii), (iii), (iv) are necessary. Removal of any of them will affect the code.

44. Which of the following type is at lowest level in terms of operating system security ?

(A) Type A

(B) Type B

(C) Type C

(D) Type D

45. The equivalent postfix express for

$d / (e + f) + b * c$  is :

(A)  $defbc / ++$

(B)  $def + / bc + *$

(C)  $def + / bc * +$

(D)  $def / ++ bc *$

46. Match the following flag bits used in the context of virtual memory management on the List I (Name of the bit) with the different purposes on the List II (Purpose) of the table mentioned :

**List I**

**(Name of the bit)**

(i) Dirty

(ii) R/W

(iii) Reference

(iv) Valid

**List II**

**(Purpose)**

(a) Page initialization

(b) Write-back policy

(c) Page protection

(d) Page replacement policy

**Codes :**

(i) (ii) (iii) (iv)

(A) (d) (a) (b) (c)

(B) (b) (c) (a) (d)

(C) (c) (d) (a) (b)

(D) (b) (c) (d) (a)

47. An operating system contains 3 user processes each requiring 2 unit of resources 'R'. The minimum number of units of 'r' such that no deadlocks will ever arise is :
- (A) 3  
(B) 5  
(C) 4  
(D) 6
48. How much extra space is used by heapsort algorithm ?
- (A)  $O(n)$   
(B)  $O(n^p)$   
(C)  $O(l)$   
(D)  $O(\log n)$
49. Consider a non-negative counting semaphore S. The operation  $P(s)$  decrements S, and  $V(s)$  increments S. During an execution, 20  $P(s)$  operations and 12  $V(s)$  operations are issued in some order. The largest initial value of S for which at least one  $P(s)$  operation will remain blocked is :
- (A) 4  
(B) 5  
(C) 6  
(D) 7
50. Where does the swap space reside ?
- (A) RAM  
(B) Disk  
(C) ROM  
(D) On chip cache
51. Which problem exists from the management perspective in the incremental model ?
- (A) System structure tends to improve as new increments are added and performs better.  
(B) System structure becomes robust as new increments added.  
(C) System structure tends to degrade as new increments are added and performs better.  
(D) System structure tends to degrade as new increments are added and regular changes corrupts its structure.
52. In development testing ..... may be simple entities such as functions or object classes, or may be coherent groupings of these entities.
- (A) Components  
(B) Table  
(C) View  
(D) Domain

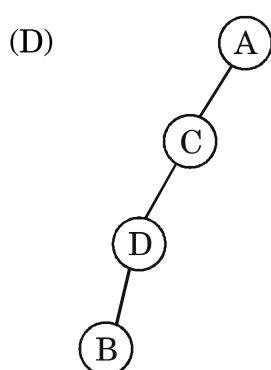
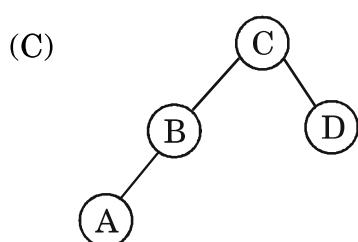
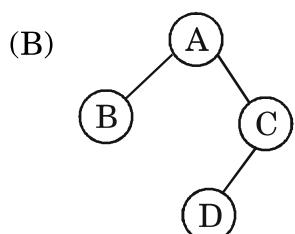
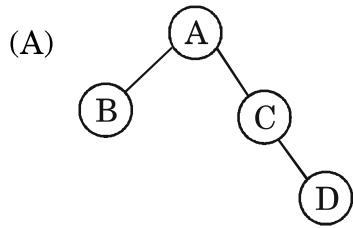
53. .... principle expect the system requirements to change and so design the system to accommodate the changes in Agile software development.
- (A) Incremental delivery  
(B) People not process  
(C) Embrace change  
(D) Maintain simplicity
54. The ..... thread of Extreme programming comes from helping build software teams at their start-ups and need to maintain flexibility.
- (A) Second  
(B) Fourth  
(C) Sixth  
(D) Seventh
55. .... are a requirements discovery technique that were first introduced in the Objectory method.
- (A) Classes  
(B) Objects  
(C) Functions  
(D) Use cases
56. Architectural models that may be developed may include :  
..... models that shows relationships, such as data flow, between the sub-systems.
- (A) Static structural  
(B) Dynamic process  
(C) Interface model  
(D) Relationship models
57. .... ensure the software development team have followed project quality procedures.
- (A) Quality assurance  
(B) Quality planning  
(C) Quality control  
(D) Quality check
58. In COCOMO II model PREX stands for .....
- (A) Personnel experience  
(B) Reliability and complexity  
(C) Personnel capability  
(D) Personal exchange
59. Who presents the code or document at an inspection meeting ?
- (A) Reader  
(B) Inspector  
(C) Chief moderator  
(D) Author

60. Which is not a factor influencing system release strategy ?  
(A) Technical quality of the system  
(B) Platform changes  
(C) Lehman's fifth law  
(D) Verification
61. The Merger sort algorithm employs the design technique :  
(A) Backtracking  
(B) Dynamic programming  
(C) Divide and Conquer  
(D) Brute force
62. A binary tree whose every node has either zero or two children is called :  
(A) Binary search tree  
(B) Extended binary tree  
(C) Complete binary tree  
(D) Skewed binary tree
63. For binary search algorithm, which of the following is not a required condition ?  
(A) The list must be sorted  
(B) There must be an easy mechanism to delete and/or insert elements in list  
(C) There should be a direct access to the middle element in any sublist  
(D) None of the above
64. A doubly linked list is :  
(A) A linear data structure  
(B) A non-linear data structure  
(C) Both linear and non-linear data structure  
(D) Neither linear nor non-linear data structure
65. Which is the odd one among the following ?  
(A) Array  
(B) Binary tree  
(C) Complete binary tree  
(D) Graph
66. If a planar graph has  $v$  vertices,  $e$  edges and  $f$  faces, then which of the following is true ?  
(A)  $e + f - v = 2$   
(B)  $e - f + v = 2$   
(C)  $v + e + f = 2$   
(D)  $v - e + f = 2$

67. Given a binary tree with :

- (i) The inorder tree traversal output as : A B C D
- (ii) The preorder tree traversal output as : C B A D

Then the original binary tree is :



68. Consider the undirected weighted graph G with 3 vertices, whose adjacency matrix is given as :

$$G = \begin{bmatrix} 0 & 2 & 2 \\ 2 & 0 & 2 \\ 2 & 2 & 0 \end{bmatrix}$$

Which of the following is true ?

- (A) Graph G has no minimum spanning tree
- (B) Graph G has a unique minimum spanning tree of cost 4
- (C) Graph G has 3 distinct minimum spanning trees, each of cost 4
- (D) Graph H has 3 spanning trees of different costs

69. The travelling salesman problem can be solved using :

- (A) BFS traversal
- (B) A spanning tree
- (C) A minimum spanning tree
- (D) DFS traversal

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70. A complete binary tree has depth, given by the formula (where  $n$  is the number nodes) :

- (A)  $n \log_2 n$
- (B)  $\log_2 n$
- (C)  $\log_2 (n + 1)$
- (D)  $n \log_2 n + 1$

71. Let  $\Sigma = \{a, b\}$ ,  $\Gamma = \{a, b, c\}$  and define ' $h$ ' by :

$$h(a) = ab$$

$$h(b) = bbc$$

$$\text{Then } h(aba) = abbbcab$$

The homomorphic image of

$$L = \{aa, aba\}$$

is the language ..... .

- (A)  $h(L) = \{abab, abbbcab\}$
- (B)  $h(L) = \{abab, abbbcab, aaaa\}$
- (C)  $h(L) = \{abab, abbbcab, bbbb\}$
- (D)  $h(L) = \{abb, abcab\}$

72. Determine the regular expression for the language accepted by  $L_1/L_2$  for  $L_1 = L(a^*baa^*)$ ,  $L_2 = (ab)^*$  :

- (A)  $a^*ba^*$
- (B)  $aba^*$
- (C)  $a^*b^*a^*$
- (D)  $(abc)^*$

73. Determine the context free grammar for the following language where  $n, m \geq 0$  :

$$L = \{w \in \{a, b\}^* \mid n_a(v) = n_b(v), \text{ where } v \text{ is any prefix of } w\}$$

- (A)  $S \rightarrow A | B$ 
  - $A \rightarrow aA | aS | \epsilon$
  - $B \rightarrow bB | \epsilon$
- (B)  $S \rightarrow A | B$ 
  - $A \rightarrow aA | aS | \epsilon$
  - $B \rightarrow bB | bS | \epsilon$
- (C)  $S \rightarrow A | B$ 
  - $A \rightarrow aA | aB | \epsilon$
  - $B \rightarrow bB | \epsilon$
- (D)  $S \rightarrow A | B$ 
  - $A \rightarrow aA | SS | \epsilon$
  - $B \rightarrow bB | bA | \epsilon$

74. Which of the following statements are true ?

S<sub>1</sub> : Left recursion is a major problem in top-down parsing and needs to be removed first.

S<sub>2</sub> : Backtracking makes the bottom-up parser delay the input processing.

S<sub>3</sub> : SLR parser has lesser number of states than canonical – LR parser.

S<sub>4</sub> : Canonical – LR parser is more powerful than LALR parser.

(A) S<sub>1</sub> and S<sub>2</sub>

(B) S<sub>1</sub> only

(C) S<sub>1</sub> and S<sub>3</sub>

(D) S<sub>1</sub>, S<sub>3</sub> and S<sub>4</sub>

75. What does Russell's paradox challenge in set theory ?

(A) Axioms of infinity

(B) Axioms of choice

(C) Axioms of regularity

(D) Axioms of foundation

76. Which one of the following is not decidable ?

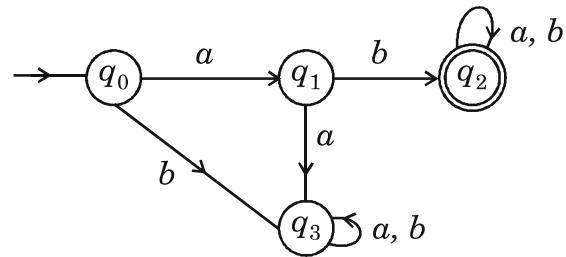
(A) Given a Turing machine M, a string S and an integer K, M accepts S with K step S

(B) Equivalence of two given Turing machines

(C) Language accepted by a given DFSA is non-empty

(D) Language generated by a CFG is non-empty

77. Determine the language accepted by the following deterministic finite accepter over  $\Sigma = \{a, b\}$  :



(A) A language that recognizes the set of all strings on  $\Sigma = \{a, b\}$  starting with prefix 'ab'

(B) A language that recognizes the set of all strings on  $\Sigma = \{a, b\}$  starting with 'ab'

(C) A language that recognizes the set of all strings on  $\Sigma = \{a, b\}$  starting with 'a' or 'b'

(D) A language that recognizes the set of all strings on  $\Sigma = \{a, b\}$  starting with any number of 'as'

78. Which of the following is a characteristic of recursive descent parsing ?
- (A) Backtracking
  - (B) Memoization
  - (C) Ambiguity
  - (D) Shift-Reduce conflicts
79. In an S-attributed definition, what distinguishes synthesized attributes from inherited attributes ?
- (A) Synthesized attributes are computed bottom-up and inherited attributes are computed top-down
  - (B) Inherited attributes are computed bottom-up and synthesized attributes are computed top-down
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81. The ..... is a program that runs on computer and servers that allows computer to communicate over a network.
- (A) System Software
  - (B) Application Software
  - (C) Windows Operating System
  - (D) Network Operating System

82. Determine the line speed for a 20-channel PCM/TDM system with a 8-kHz sample rate, 10 bits per sample and one framing bit per frame.
- (A) 1.608 Mbps  
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(C) 3.406 Mbps  
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83. In dual cable system to transmit a data a computer outputs the data on to cable 1, which runs to the device called the ..... at the root of the cable tree.
- (A) tail end  
(B) after one hop  
(C) head end  
(D) round trip
84. What is the broad band frequency in telephone network ?
- (A) 4 kHz  
(B) 3 kHz  
(C) 2 kHz  
(D) 1 kHz
85. In wireless networks CDPD stands for ..... .
- (A) Carrier Data Packet Data  
(B) Collision Detection in Packet Data  
(C) Cellular Digital Packet Distribution  
(D) Cellular Digital Packet Data
86. Which device is used to connect different networks that provide necessary translation both in terms of hardware and software ?
- (A) Switches  
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(C) Hubs  
(D) Gateways
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- (A) 101101011  
(B) 101101010  
(C) 001101010  
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88. In computer networks, Pulse Code Modulation (PCM) method is used for digitizing analog voice signals usually samples, the incoming voice signal once every ..... microseconds.
- (A) 75  
(B) 125  
(C) 175  
(D) 225
89. What is the fixed-size blocks used by Trivial File Transfer Protocol to transfer the data ?
- (A) 128 bytes  
(B) 256 bytes  
(C) 512 bytes  
(D) 1024 bytes
90. What are the highly stable and highly volatile values that are assigned to the information in Time-to-live field ?
- (A) 86400 and 60  
(B) 36000 and 0  
(C) 128000 and 128  
(D) 120000 and 60
91. In LISP the function that provides the initial element of a list is :
- (A) Car  
(B) Set  
(C) Second  
(D) First
92. In neural network, the network capacity is defined as :
- (A) The traffic (tarry capacity of network)  
(B) The total number of nodes in the network  
(C) The number of patterns that can be stored and recalled in a network  
(D) The numbers of computes in a network
93. What term describes the scenario where the training error of a model decreases while the test error increases ?
- (A) Over fitting  
(B) Under fitting  
(C) Testing error  
(D) Proper fitting

94. What is Coreference Resolution ?

- (A) Anaphora Resolution
- (B) Given a sentence or larger chunk of text determine which words (mentions) refer to the same objects (entities)
- (C) Solution obtained through coreference
- (D) Solution of a previous solved problem

95. .... is the type of morphology that changes the word category and affect the meaning.

- (A) Inflectional
- (B) Derivational
- (C) Cliticization
- (D) Infuational

96. Consider the following statements :

**Statement (1) :** In the logistic regression model we pass the values of  $W \cdot x + b$  (for every  $x$  in the dot set) through a sigmoid function to return a probabilistic class label.

**Statement (2) :** In the logistic regression model, if the value  $(W \cdot x + b)$  given to the sigmoid function is close to zero. Then the class label predicted (with a 0.5 threshold) is very certain and reliable.

- (A) Only (1) is correct
- (B) Only (2) is correct
- (C) Both (1) and (2) are correct
- (D) Neither (1) nor (2) is correct

97. A general fuzzy controller consists of ..... .
- (A) Fuzzy rule base, fuzzy inference engine and fuzzification/defuzzification modules
- (B) Fuzzy functions, fuzzy inference engine and fuzzification/defuzzification modules
- (C) Fuzzy rule base, fuzzy data engine and fuzzification/defuzzification modules
- (D) Fuzzy functions, fuzzy data engine and fuzzification/defuzzification modules
98. Which of the following is not a correct encoding technique used in genetic algorithms ?
- (A) Premier encoding
- (B) Tree encoding
- (C) Binary encoding
- (D) Value encoding
99. A neuron has five inputs given by  $I = \{1, 3, 2, -1, 3\}$  and corresponding weights are  $W = \{0.5, 2, -1, 2, -0.5\}$ . The bias  $b = 0$  and slope parameter  $\alpha = 1$ . The sigmoid activation function is used to generate final output  $y$ . What is the value of  $y$  ?
- (A) -1
- (B) 0.52
- (C) 0.73
- (D) 0.92
100. Which among the following minimizes the upper bound of the generalization error and maximizes the margin between a separating hyperplane and the training data, instead of minimizing the training error ?
- (A) Boltzmann machine
- (B) SVM
- (C) Hopfield neural network
- (D) RBF

## **Computer Science and Applications**

### **Paper II**

**Time Allowed : 120 Minutes]**

**[Maximum Marks : 200**

**Note :** This paper contains **Hundred (100)** multiple choice questions. Each question carrying **Two (2)** marks. Attempt *All* questions.

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1. What is the difference between a “shallow copy” and a “deep copy” in the context of programming languages ?</p> <p>(A) Shallow copy duplicates only references, while deep copy duplicates entire object</p> <p>(B) Shallow copy duplicates entire object, while deep copy duplicates only references</p> <p>(C) Shallow copy duplicates only system variables, whereas deep copy duplicated user defined variables</p> <p>(D) Shallow copy duplicates only user defined variables, whereas deep copy duplicated system variables</p> | <p>2. The term “snapshot” is used in the context of virtualization to refer to ..... .</p> <p>(A) Backup of virtual machine’s current state</p> <p>(B) Backup of host operating system’s current state</p> <p>(C) Backup of guest operating system’s current state</p> <p>(D) Backup of guest applications current state</p> <p>3. Predict the output of the following source code in C language :</p> <pre>int main( ) {     int i, x[5];     for(i=0; i&lt;5; i++) * (x+i) = i;     for(i=0; i&lt;5; i++) printf("%d", x[i]);     return 0; }</pre> <p>(A) 0 1 2 3 4</p> <p>(B) Syntax Error</p> <p>(C) Semantic Error</p> <p>(D) Garbage Value</p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

4. Predict the output of the following

C source code :

```
int x = 10;
```

```
int main()
```

```
{
```

```
 int x = 20;
```

```
{
```

```
 int x = 30;
```

```
{extern x; printf("%d", x);}
```

```
}
```

```
return 0;
```

```
}
```

(A) 10

(B) 20

(C) 30

(D) 10 20 30

5. class C {

public:

```
void f(int a) {cout << a;}
```

```
void f(int a, int b) {cout << a+b;};
```

```
void f(int a, int b, int c) {cout << a+b+c;}
```

```
};
```

```
int main()
```

```
{
```

```
 C obj;
```

```
 obj.f(10);
```

```
 obj.f(10, 20);
```

```
 obj.f(10, 20, 30);
```

```
 return 0;
```

```
}
```

The above C++ source code exemplifies which of the following principle with respect to object-oriented programming ?

(A) Abstraction

(B) Encapsulation

(C) Inheritance

(D) Polymorphism

6. Predict the output of this source code written in C++ language :
- ```
class C1{
public:
    void display() {cout<<"Hello";}
};

class C2; public C1{
public:
    void display() {cout<<"World";}
};

int main(void) {
    C1* ptr = new C2;
    ptr->display();
    return 0;
}
```
- (A) Hello
(B) World
(C) Hello World
(D) World Hello
7. Which of the following activities is not an application of XML ?
- (A) Data storage
(B) Data transmission
(C) Multiple rendering of the same data
(D) Interaction with the user to get the data

8. Which of the following statements is not true with respect to Applets ?
- (A) All web browsers support Applets
(B) Applets are vulnerable from security perspective
(C) Applets can communicate with their server on their own
(D) Applets can play multimedia on client side
9. A transformation that distorts the shape of an object such that the transformed shape appears as if the object was composed of internal layers that had been caused to slide over each other is called as
- (A) Reflection
(B) Shear
(C) Dither
(D) Translation
10. Which of the following materials has highest spectacular reflection coefficient at an angle of 45° of incidence over it ?
- (A) Water
(B) Glass
(C) Gold
(D) Silver

11. Which of the following commands is used to save any transaction permanently into the database ?
- (A) Redo
(B) Commit
(C) Rollback
(D) Undo
12. The maximum number of children that a B-tree of order m can have :
- (A) $m + 1$
(B) $m - 1$
(C) m
(D) $2m$
13. Which of the following commands can be used SQL to delete all the records in the table work ?
- (A) Delete from work
(B) Delete from work where Id = 'Null'
(C) Remove table work
(D) Drop table work
14. A database is :
- (A) an organized collection of data or information that can be only accessed
(B) an organized collection of data or information that can be only managed
(C) an organized collection of data or information that can be accessed, updated and managed
(D) an organized collection of data or information that cannot be updated
15. The data contained in the data warehouse is described by :
- (A) Relational data
(B) Meta data
(C) Operational data
(D) Active data
16. An advantage of distributed database over a centralized database :
- (A) Modular growth
(B) Software cost
(C) Software complexity
(D) Slow response

17. In the context of functional dependency, Armstrong inference rules refer to :
- (A) Reflexivity, Decomposition and Transitivity
 - (B) Decomposition and Transitivity
 - (C) Transitivity, Augmentation and Reflexivity
 - (D) Decomposition and Reflexivity
18. For the SQL query given below :
- ```
SELECT employee_name
FROM employee
WHERE salary BETWEEN 70000
and 130000
```
- Select the equivalent in SQL without BETWEEN operator :
- (A) SELECT employee\_name  
FROM employee  
WHERE salary > 70000 and  
salary < 130000
  - (B) SELECT employee\_name  
FROM employee  
WHERE salary = 70000 and  
salary = 130000
  - (C) SELECT employee\_name  
FROM employee  
WHERE salary >= 70000 and  
salary <= 130000
  - (D) SELECT employee\_name  
FROM employee  
WHERE salary < 70000 and  
salary > 130000
19. A transaction enters into its partially committed state :
- (A) When it finishes the execution of final statement
  - (B) When it starts the execution of first statement
  - (C) After writing ‘COMMIT’ into log
  - (D) It never enters partially committed state
20. Consider the relation scheme (M, N, O, P, Q, R) with the following set of functional dependencies :
- $$F = \{MO \rightarrow PQ, MPR \rightarrow NO\}$$
- Which of the following is the trivial functional dependencies in  $F^+$ , where  $F^+$  is closure of F ?
- (A) MO  $\rightarrow$  PQ
  - (B) MO  $\rightarrow$  OP
  - (C) MP  $\rightarrow$  P
  - (D) MPR  $\rightarrow$  N
21. In what tree, for every node the height of its left subtree and right subtree differ at least by one :
- (A) AVL tree
  - (B) Threaded binary tree
  - (C) Binary search tree
  - (D) Complete tree
22. An example of a distributed OS is :
- (A) Amoeba
  - (B) UNIX
  - (C) MS-DOS
  - (D) MULTICS

23. Consider the following proposed solution to dining philosopher's problem to avoid deadlock. Consider the binary semaphore lock initialized to 1.

```
Philosopher (int i)
{
 while (1)
 {
 think ();
 wait (lock);(i)
 wait (fork [i]);
 wait (fork [(i+1)%5]);
 signal (lock); (ii)
 eat();
 wait (lock); (iii)
 signal (fork [i]);
 signal (fork (i + 1) % 5);
 signal (lock); (iv)
 }
}
```

- Which of the following is correct ?
- (A) Removing (i) and (ii) will not affect the code. The code will work fine.
  - (B) Removing (iii) and (iv) will not affect the code. The code will work fine.
  - (C) Removing (i), (ii), (iii), (iv) will not affect the code. The code will work fine.
  - (D) All (i), (ii), (iii), (iv) are necessary. Removal of any of them will affect the code.

24. Which of the following type is at lowest level in terms of operating system security ?

- (A) Type A
- (B) Type B
- (C) Type C
- (D) Type D

25. The equivalent postfix express for

- $d / (e + f) + b * c$  is :
- (A)  $defbc / ++$
  - (B)  $def + / bc + *$
  - (C)  $def + / bc * +$
  - (D)  $def / ++ bc *$

26. Match the following flag bits used in the context of virtual memory management on the List I (Name of the bit) with the different purposes on the List II (Purpose) of the table mentioned :

**List I**

**(Name of the bit)**

- (i) Dirty
- (ii) R/W
- (iii) Reference
- (iv) Valid

**List II**

**(Purpose)**

- (a) Page initialization
- (b) Write-back policy
- (c) Page protection
- (d) Page replacement policy

**Codes :**

- (i) (ii) (iii) (iv)
- (A) (d) (a) (b) (c)
- (B) (b) (c) (a) (d)
- (C) (c) (d) (a) (b)
- (D) (b) (c) (d) (a)

27. An operating system contains 3 user processes each requiring 2 unit of resources 'R'. The minimum number of units of 'r' such that no deadlocks will ever arise is :

- (A) 3
- (B) 5
- (C) 4
- (D) 6

28. How much extra space is used by heapsort algorithm ?

- (A)  $O(n)$
- (B)  $O(n^p)$
- (C)  $O(l)$
- (D)  $O(\log n)$

29. Consider a non-negative counting semaphore S. The operation  $P(s)$  decrements S, and  $V(s)$  increments S. During an execution, 20  $P(s)$  operations and 12  $V(s)$  operations are issued in some order. The largest initial value of S for which at least one  $P(s)$  operation will remain blocked is :

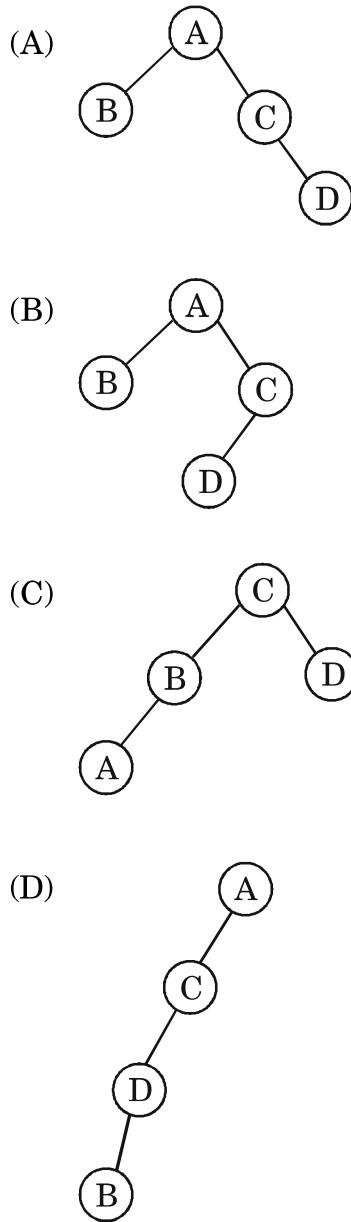
- (A) 4
- (B) 5
- (C) 6
- (D) 7

30. Where does the swap space reside ?  
(A) RAM  
(B) Disk  
(C) ROM  
(D) On chip cache
31. Which problem exists from the management perspective in the incremental model ?  
(A) System structure tends to improve as new increments are added and performs better.  
(B) System structure becomes robust as new increments added.  
(C) System structure tends to degrade as new increments are added and performs better.  
(D) System structure tends to degrade as new increments are added and regular changes corrupts its structure.
32. In development testing ..... may be simple entities such as functions or object classes, or may be coherent groupings of these entities.  
(A) Components  
(B) Table  
(C) View  
(D) Domain
33. ..... principle expect the system requirements to change and so design the system to accommodate the changes in Agile software development.  
(A) Incremental delivery  
(B) People not process  
(C) Embrace change  
(D) Maintain simplicity
34. The ..... thread of Extreme programming comes from helping build software teams at their start-ups and need to maintain flexibility.  
(A) Second  
(B) Fourth  
(C) Sixth  
(D) Seventh
35. ..... are a requirements discovery technique that were first introduced in the Objectory method.  
(A) Classes  
(B) Objects  
(C) Functions  
(D) Use cases

36. Architectural models that may be developed may include :  
..... models that shows relationships, such as data flow, between the sub-systems.
- (A) Static structural  
(B) Dynamic process  
(C) Interface model  
(D) Relationship models
37. ..... ensure the software development team have followed project quality procedures.
- (A) Quality assurance  
(B) Quality planning  
(C) Quality control  
(D) Quality check
38. In COCOMO II model PREX stands for .....
- (A) Personnel experience  
(B) Reliability and complexity  
(C) Personnel capability  
(D) Personal exchange
39. Who presents the code or document at an inspection meeting ?
- (A) Reader  
(B) Inspector  
(C) Chief moderator  
(D) Author
40. Which is not a factor influencing system release strategy ?
- (A) Technical quality of the system  
(B) Platform changes  
(C) Lehman's fifth law  
(D) Verification
41. The Merger sort algorithm employs the design technique :
- (A) Backtracking  
(B) Dynamic programming  
(C) Divide and Conquer  
(D) Brute force
42. A binary tree whose every node has either zero or two children is called :
- (A) Binary search tree  
(B) Extended binary tree  
(C) Complete binary tree  
(D) Skewed binary tree
43. For binary search algorithm, which of the following is not a required condition ?
- (A) The list must be sorted  
(B) There must be an easy mechanism to delete and/or insert elements in list  
(C) There should be a direct access to the middle element in any sublist  
(D) None of the above

44. A doubly linked list is :
- (A) A linear data structure
  - (B) A non-linear data structure
  - (C) Both linear and non-linear data structure
  - (D) Neither linear nor non-linear data structure
45. Which is the odd one among the following ?
- (A) Array
  - (B) Binary tree
  - (C) Complete binary tree
  - (D) Graph
46. If a planar graph has  $v$  vertices,  $e$  edges and  $f$  faces, then which of the following is true ?
- (A)  $e + f - v = 2$
  - (B)  $e - f + v = 2$
  - (C)  $v + e + f = 2$
  - (D)  $v - e + f = 2$

47. Given a binary tree with :
- (i) The inorder tree traversal output as : A B C D
  - (ii) The preorder tree traversal output as : C B A D
- Then the original binary tree is :



48. Consider the undirected weighted graph G with 3 vertices, whose adjacency matrix is given as :

$$G = \begin{bmatrix} 0 & 2 & 2 \\ 2 & 0 & 2 \\ 2 & 2 & 0 \end{bmatrix}$$

Which of the following is true ?

- (A) Graph G has no minimum spanning tree
  - (B) Graph G has a unique minimum spanning tree of cost 4
  - (C) Graph G has 3 distinct minimum spanning trees, each of cost 4
  - (D) Graph H has 3 spanning trees of different costs
49. The travelling salesman problem can be solved using :
- (A) BFS traversal
  - (B) A spanning tree
  - (C) A minimum spanning tree
  - (D) DFS traversal

50. A complete binary tree has depth, given by the formula (where n is the number nodes) :

- (A)  $n \log_2 n$
- (B)  $\log_2 n$
- (C)  $\log_2 (n + 1)$
- (D)  $n \log_2 n + 1$

51. Let  $\Sigma = \{a, b\}$ ,  $\Gamma = \{a, b, c\}$  and define 'h' by :

$$h(a) = ab$$

$$h(b) = bbc$$

$$\text{Then } h(aba) = abbbcab$$

The homomorphic image of

$$L = \{aa, aba\}$$

is the language ..... .

- (A)  $h(L) = \{abab, abbbcab\}$
- (B)  $h(L) = \{abab, abbbcab, aaaa\}$
- (C)  $h(L) = \{abab, abbbcab, bbbb\}$
- (D)  $h(L) = \{abb, abcab\}$

52. Determine the regular expression for the language accepted by  $L_1/L_2$  for  $L_1 = L(a^*baa^*)$ ,  $L_2 = (ab)^*$  :

- (A)  $a^*ba^*$
- (B)  $aba^*$
- (C)  $a^*b^*a^*$
- (D)  $(abc)^*$

53. Determine the context free grammar for the following language where  $n, m \geq 0$  :

$L = \{w \in \{a, b\}^* \mid n_a(v) = n_b(v), \text{ where } v \text{ is any prefix of } w\}$

- (A)  $S \rightarrow A | B$ 
  - $A \rightarrow aA | aS | \epsilon$
  - $B \rightarrow bB | \epsilon$
- (B)  $S \rightarrow A | B$ 
  - $A \rightarrow aA | aS | \epsilon$
  - $B \rightarrow bB | bS | \epsilon$
- (C)  $S \rightarrow A | B$ 
  - $A \rightarrow aA | aB | \epsilon$
  - $B \rightarrow bB | \epsilon$
- (D)  $S \rightarrow A | B$ 
  - $A \rightarrow aA | SS | \epsilon$
  - $B \rightarrow bB | bA | \epsilon$

54. Which of the following statements are true ?

$S_1$  : Left recursion is a major problem in top-down parsing and needs to be removed first.

$S_2$  : Backtracking makes the bottom-up parser delay the input processing.

$S_3$  : SLR parser has lesser number of states than canonical – LR parser.

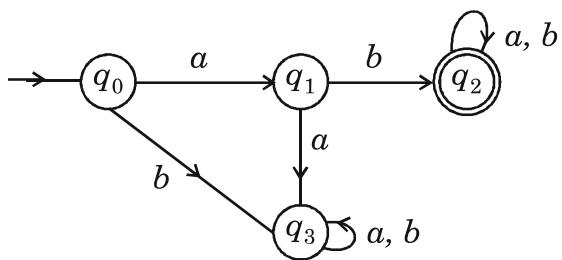
$S_4$  : Canonical – LR parser is more powerful than LALR parser.

- (A)  $S_1$  and  $S_2$
- (B)  $S_1$  only
- (C)  $S_1$  and  $S_3$
- (D)  $S_1, S_3$  and  $S_4$

55. What does Russell's paradox challenge in set theory ?

- (A) Axioms of infinity
- (B) Axioms of choice
- (C) Axioms of regularity
- (D) Axioms of foundation

56. Which one of the following is not decidable ?
- Given a Turing machine M, a string S and an integer K, M accepts S with K step S
  - Equivalence of two given Turing machines
  - Language accepted by a given DFSA is non-empty
  - Language generated by a CFG is non-empty
57. Determine the language accepted by the following deterministic finite accepter over  $\Sigma = \{a, b\}$  :



- A language that recognizes the set of all strings on  $\Sigma = \{a, b\}$  starting with prefix 'ab'
- A language that recognizes the set of all strings on  $\Sigma = \{a, b\}$  starting with 'ab'
- A language that recognizes the set of all strings on  $\Sigma = \{a, b\}$  starting with 'a' or 'b'
- A language that recognizes the set of all strings on  $\Sigma = \{a, b\}$  starting with any number of 'as'

58. Which of the following is a characteristic of recursive descent parsing ?
- Backtracking
  - Memoization
  - Ambiguity
  - Shift-Reduce conflicts
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(D) 1024 bytes
70. What are the highly stable and highly volatile values that are assigned to the information in Time-to-live field ?
- (A) 86400 and 60  
(B) 36000 and 0  
(C) 128000 and 128  
(D) 120000 and 60

71. In LISP the function that provides the initial element of a list is :
- (A) Car
  - (B) Set
  - (C) Second
  - (D) First
72. In neural network, the network capacity is defined as :
- (A) The traffic (tarry capacity of network)
  - (B) The total number of nodes in the network
  - (C) The number of patterns that can be stored and recalled in a network
  - (D) The numbers of computes in a network
73. What term describes the scenario where the training error of a model decreases while the test error increases ?
- (A) Over fitting
  - (B) Under fitting
  - (C) Testing error
  - (D) Proper fitting
74. What is Coreference Resolution ?
- (A) Anaphora Resolution
  - (B) Given a sentence or larger chunk of text determine which words (mentions) refer to the same objects (entities)
  - (C) Solution obtained through coreference
  - (D) Solution of a previous solved problem
75. ..... is the type of morphology that changes the word category and affect the meaning.
- (A) Inflectional
  - (B) Derivational
  - (C) Cliticization
  - (D) Infuational

76. Consider the following statements :

**Statement (1) :** In the logistic regression model we pass the values of  $W \cdot x + b$  (for every  $x$  in the dot set) through a sigmoid function to return a probabilistic class label.

**Statement (2) :** In the logistic regression model, if the value  $(W \cdot x + b)$  given to the sigmoid function is close to zero. Then the class label predicted (with a 0.5 threshold) is very certain and reliable.

- (A) Only (1) is correct
- (B) Only (2) is correct
- (C) Both (1) and (2) are correct
- (D) Neither (1) nor (2) is correct

77. A general fuzzy controller consists of .....

- (A) Fuzzy rule base, fuzzy inference engine and fuzzification/defuzzification modules
- (B) Fuzzy functions, fuzzy inference engine and fuzzification/defuzzification modules
- (C) Fuzzy rule base, fuzzy data engine and fuzzification/defuzzification modules
- (D) Fuzzy functions, fuzzy data engine and fuzzification/defuzzification modules

78. Which of the following is not a correct encoding technique used in genetic algorithms ?

- (A) Premier encoding
- (B) Tree encoding
- (C) Binary encoding
- (D) Value encoding

79. A neuron has five inputs given by  $I = \{1, 3, 2, -1, 3\}$  and corresponding weights are  $W = \{0.5, 2, -1, 2, -0.5\}$ . The bias  $b = 0$  and slope parameter  $\alpha = 1$ . The sigmoid activation function is used to generate final output  $y$ . What is the value of  $y$  ?
- (A) -1  
(B) 0.52  
(C) 0.73  
(D) 0.92
80. Which among the following minimizes the upper bound of the generalization error and maximizes the margin between a separating hyperplane and the training data, instead of minimizing the training error ?
- (A) Boltzmann machine  
(B) SVM  
(C) Hopfield neural network  
(D) RBF

81. The inference rule deals exclusively with formulas in conjunctive normal forms is called as :
- (A) Resolution rule  
(B) Contingency rule  
(C) Unsatisfiability rule  
(D) Contradiction rule
82. Let  $A$  and  $B$  be the sets. The symmetric difference between  $A$  and  $B$  is :
- (A)  $A \oplus B = (A - B) \cup (B - A)$   
(B)  $A \cup B = (A \oplus B) \cap (B + A)$   
(C)  $A \cap B = (B + A) - (B - A)$   
(D)  $A \subseteq B = (A - B) \cup (B + A)$

83. A deck of playing cards contains 52 cards, 4 each with face values in the set {A, 2, 3, 4, 5, 6, 7, 8, 9, 10, J, Q, K}. Let us define face values of the top and bottom cards as X and Y. The shuffling algorithm is defined as follows :

**Sh1 :** Permute the cards randomly due to that each arrangement occurs with probability  $1/52!$

**Sh2 :** If  $X \neq Y$ , flip the biased coin that comes up heads with probability P and go back to Sh1 if heads turns up otherwise stop.

Each coin flip and each permutation is assumed to be independent of all the other randomization. What value of P will make X and Y independent random variables once this process of shuffling will stops ?

- (A)  $P = 1/4$
- (B)  $P = 2/3$
- (C)  $P = 1/3$
- (D)  $P = 1/5$

84. Identify the number of distinct string of length 2 of the combinations of blue and yellow beads. The both ends of the strings are not marked due to this they are indistinguishable if interchanging the ends of one will results other. Denote b and y as a blue and yellow beads. Let us consider bb, by, yb and yy are the four different strings of length 2 when equivalence between strings is not taken into the consideration. The number of equivalent classes into which the set  $s = (bb, by, yb, yy)$  is divided by equivalent relation induced by the group of permutation  $[\{\Pi_1, \Pi_2\}, 0]$  where :

$$\Pi_1 = \begin{pmatrix} bb & by & yb & yy \\ bb & by & yb & yy \end{pmatrix}$$

$$\Pi_2 = \begin{pmatrix} bb & by & yb & yy \\ bb & yb & by & yy \end{pmatrix}$$

- (A) 3
- (B) 4
- (C) 5
- (D) 6

85. Design a K-Map for  $F(x, y, z) = x\bar{z} + xy\bar{z} + y\bar{z}$  of  $F(x, y, z)$  and find prime implicants.

- (A)  $xy, y\bar{z}, x\bar{z}$
- (B)  $x, y, z$
- (C)  $\bar{x}y, yz, x\bar{z}$
- (D)  $x\bar{y}, yz, \bar{x}z$

86. 11 students plan to have dinner together for multiple days. They will be seated at the round table. Their plan is to ensure that each student sits next to different neighbours at every dinner. How many days can this arrangement be sustained ?

- (A) 5
- (B) 11
- (C) 4
- (D) 7

87. Explore all 5 letter combinations formed using the letters  $a$  through  $h$ . How many of these words contains no repeats, also do not include the subword “bad” ?

- (A) 6660
- (B) 6667
- (C) 6578
- (D) 6312

88. Suppose  $G$  is the graph with  $n$  vertices such that every vertex having degree 5. What is the smallest value of  $n$  for which graph might be planar ?

- (A)  $\frac{5n}{2}$
- (B)  $5n$
- (C)  $2n$
- (D)  $\frac{2n}{5}$

89. Let us consider the full Coca-Cola bottles, 7 half-full and 7 empty. You want to divide the 21 bottles among three persons so that each will receive exactly 7. Moreover, each person must receive the same quantity of Coca-Cola. Solve the problem using Integer Linear programming and find a solution.

What will be the objective function ?

(A) There will be a dummy objective function with all zero coefficients.

| Status    | Number of bottles assigned to person |   |   |
|-----------|--------------------------------------|---|---|
|           | 1                                    | 2 | 3 |
| Full      | 1                                    | 3 | 3 |
| Half-full | 5                                    | 1 | 1 |
| Empty     | 1                                    | 3 | 3 |

(B) Objective function will be maximize the total quantity of Coca-Cola distribution.

| Status    | Number of bottles assigned to person |   |   |
|-----------|--------------------------------------|---|---|
|           | 1                                    | 2 | 3 |
| Full      | 3                                    | 1 | 2 |
| Half-full | 2                                    | 1 | 3 |
| Empty     | 2                                    | 5 | 1 |

(C) Objective function will be minimize the empty bottles.

| Status    | Number of bottles assigned to person |   |   |
|-----------|--------------------------------------|---|---|
|           | 1                                    | 2 | 3 |
| Full      | 0                                    | 1 | 2 |
| Half-full | 0                                    | 1 | 3 |
| Empty     | 7                                    | 5 | 2 |

(D) Set of a binary variable is represented for full bottle representation.

| Status    | Number of bottles assigned to person |   |   |
|-----------|--------------------------------------|---|---|
|           | 1                                    | 2 | 3 |
| Full      | 1                                    | 5 | 2 |
| Half-full | 2                                    | 1 | 2 |
| Empty     | 4                                    | 1 | 3 |

90. Consider the following linear programming problem :

$$\text{Maximize } Z = 2x_1 + 3x_2$$

$$\text{Subject to : } x_1 + 3x_2 \leq 12$$

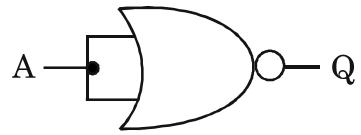
$$3x_1 + 2x_2 \leq 12$$

$$x_1, x_2 \geq 0$$

At which points of graphical solution space the infeasible basic optimum solutions are represented ?

- (A) Corner points  $(x_1 = 0, x_2 = 6)$  and  $(x_1 = 12, x_2 = 0)$  are infeasible
- (B) Corner points  $(x_1 = 10.29, x_2 = 2)$  and  $(x_1 = 0, x_2 = 3.34)$  are infeasible
- (C) Corner points  $(x_1 = 12.20, x_2 = 6)$  and  $(x_1 = 0, x_2 = 5.24)$  are infeasible
- (D) None of the corner points are infeasible

91. Given Logic Gate represents which of the following Truth Table ?



| A | Q |
|---|---|
| 0 | 0 |
| 1 | 0 |

| A | Q |
|---|---|
| 0 | 1 |
| 1 | 1 |

| A | Q |
|---|---|
| 0 | 0 |
| 1 | 1 |

| A | Q |
|---|---|
| 0 | 1 |
| 1 | 0 |

92. “100” is a number in Decimal Number System. What will be its representation in Octal Number System ?

- (A) 100
- (B) 144
- (C) 414
- (D) 441

93. The following Truth Table represents which Logical Micro-operation ?

| A | B | F |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

- (A)  $F \leftarrow A \wedge B$   
 (B)  $F \leftarrow \overline{A} \wedge B$   
 (C)  $F \leftarrow A \oplus B$   
 (D)  $F \leftarrow \overline{A} \oplus B$
94. Which of the following is not expected from a clock pulse in CPU ?
- (A) It is not applied to all registers.  
 (B) It changes the state of registers as per control signal requirements.  
 (C) It allows synchronization of various activities.  
 (D) It may trigger the loading of data into registers or the transfer of data between registers.

95. Which of the following task is performed by Direct Memory Access (DMA) in a computer system ?

- (A) allow data transfer between a storage unit and CPU independent of memory  
 (B) allow data transfer between a storage unit and main memory independent of CPU  
 (C) allow data transfer between a storage unit and main memory under CPU control  
 (D) allow data transfer between CPU and main memory independent of a storage unit

96. Which of the following statements is not true with respect to a Hardwired Control Unit in comparison with a Micro-programmed Control Unit ?

- (A) It does not require control memory  
 (B) It provides better execution speed  
 (C) It enables a simpler control unit design  
 (D) It does not allow for flexible control unit design

97. Stack Pointer Register (SP) in x86 architecture is generally used to ..... .
- (A) point base of the stack
  - (B) point top of the stack
  - (C) point top or based of the stack based on opcode
  - (D) point top or based of the stack based on addressing mode
98. Which of the following computer systems is represented when a computer can process several programs at the same time ?
- (A) Single Instruction Stream, Single Data Stream (SISD)
  - (B) Single Instruction Stream, Multiple Data Stream (SIMD)
  - (C) Multiple Instruction Stream, Single Data Stream (MISD)
  - (D) Multiple Instruction Stream, Multiple Data Stream (MIMD)

99. Which Redundant Array of Independent Disks (RAID) technology maintains copy of an entire hard disk on other hard disk ?
- (A) RAID 0
  - (B) RAID 1
  - (C) RAID 5
  - (D) RAID 10
100. Which type of memory allows computer system to execute computer programs requiring more memory than physically available ?
- (A) Auxiliary Memory
  - (B) Associative Memory
  - (C) Cache Memory
  - (D) Virtual Memory

## **Computer Science and Applications Paper II**

**Time Allowed : 120 Minutes]**

**[Maximum Marks : 200**

**Note :** This paper contains **Hundred (100)** multiple choice questions. Each question carrying **Two (2)** marks. Attempt *All* questions.

1. In what tree, for every node the height of its left subtree and right subtree differ at least by one :
  - (A) AVL tree
  - (B) Threaded binary tree
  - (C) Binary search tree
  - (D) Complete tree
2. An example of a distributed OS is :
  - (A) Amoeba
  - (B) UNIX
  - (C) MS-DOS
  - (D) MULTICS

3. Consider the following proposed solution to dining philosopher's problem to avoid deadlock. Consider the binary semaphore lock initialized to 1.

```
Philosopher (int i)
{
 while (1)
 {
 think ();
 wait (lock);(i)
 wait (fork [i]);
 wait (fork [(i+1)%5]);
 signal (lock); (ii)
 eat();
 wait (lock); (iii)
 signal (fork [i]);
 signal (fork (i + 1) % 5);
 signal (lock); (iv)
 }
}
```

Which of the following is correct ?

- (A) Removing (i) and (ii) will not affect the code. The code will work fine.
- (B) Removing (iii) and (iv) will not affect the code. The code will work fine.
- (C) Removing (i), (ii), (iii), (iv) will not affect the code. The code will work fine.
- (D) All (i), (ii), (iii), (iv) are necessary. Removal of any of them will affect the code.

4. Which of the following type is at lowest level in terms of operating system security ?

(A) Type A

(B) Type B

(C) Type C

(D) Type D

5. The equivalent postfix express for

$d / (e + f) + b * c$  is :

(A)  $defbc / ++$

(B)  $def + / bc + *$

(C)  $def + / bc * +$

(D)  $def / ++ bc *$

6. Match the following flag bits used in the context of virtual memory management on the List I (Name of the bit) with the different purposes on the List II (Purpose) of the table mentioned :

**List I**

**(Name of the bit)**

(i) Dirty

(ii) R/W

(iii) Reference

(iv) Valid

**List II**

**(Purpose)**

(a) Page initialization

(b) Write-back policy

(c) Page protection

(d) Page replacement policy

**Codes :**

(i) (ii) (iii) (iv)

(A) (d) (a) (b) (c)

(B) (b) (c) (a) (d)

(C) (c) (d) (a) (b)

(D) (b) (c) (d) (a)

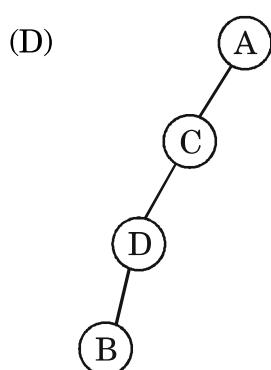
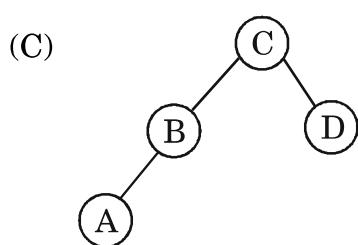
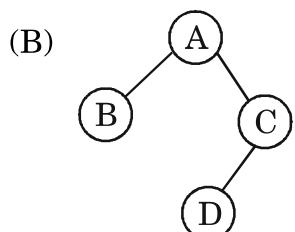
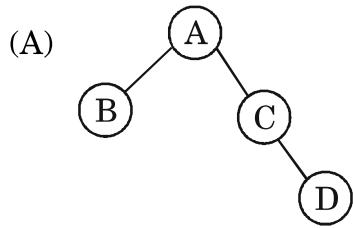
7. An operating system contains 3 user processes each requiring 2 unit of resources ‘R’. The minimum number of units of ‘r’ such that no deadlocks will ever arise is :
- (A) 3  
(B) 5  
(C) 4  
(D) 6
8. How much extra space is used by heapsort algorithm ?
- (A)  $O(n)$   
(B)  $O(n^p)$   
(C)  $O(l)$   
(D)  $O(\log n)$
9. Consider a non-negative counting semaphore S. The operation  $P(s)$  decrements S, and  $V(s)$  increments S. During an execution, 20  $P(s)$  operations and 12  $V(s)$  operations are issued in some order. The largest initial value of S for which at least one  $P(s)$  operation will remain blocked is :
- (A) 4  
(B) 5  
(C) 6  
(D) 7
10. Where does the swap space reside ?
- (A) RAM  
(B) Disk  
(C) ROM  
(D) On chip cache
11. Which problem exists from the management perspective in the incremental model ?
- (A) System structure tends to improve as new increments are added and performs better.  
(B) System structure becomes robust as new increments added.  
(C) System structure tends to degrade as new increments are added and performs better.  
(D) System structure tends to degrade as new increments are added and regular changes corrupts its structure.
12. In development testing ..... may be simple entities such as functions or object classes, or may be coherent groupings of these entities.
- (A) Components  
(B) Table  
(C) View  
(D) Domain

13. .... principle expect the system requirements to change and so design the system to accommodate the changes in Agile software development.
- (A) Incremental delivery  
(B) People not process  
(C) Embrace change  
(D) Maintain simplicity
14. The ..... thread of Extreme programming comes from helping build software teams at their start-ups and need to maintain flexibility.
- (A) Second  
(B) Fourth  
(C) Sixth  
(D) Seventh
15. .... are a requirements discovery technique that were first introduced in the Objectory method.
- (A) Classes  
(B) Objects  
(C) Functions  
(D) Use cases
16. Architectural models that may be developed may include :  
..... models that shows relationships, such as data flow, between the sub-systems.
- (A) Static structural  
(B) Dynamic process  
(C) Interface model  
(D) Relationship models
17. .... ensure the software development team have followed project quality procedures.
- (A) Quality assurance  
(B) Quality planning  
(C) Quality control  
(D) Quality check
18. In COCOMO II model PREX stands for .....
- (A) Personnel experience  
(B) Reliability and complexity  
(C) Personnel capability  
(D) Personal exchange
19. Who presents the code or document at an inspection meeting ?
- (A) Reader  
(B) Inspector  
(C) Chief moderator  
(D) Author

20. Which is not a factor influencing system release strategy ?  
(A) Technical quality of the system  
(B) Platform changes  
(C) Lehman's fifth law  
(D) Verification
21. The Merger sort algorithm employs the design technique :  
(A) Backtracking  
(B) Dynamic programming  
(C) Divide and Conquer  
(D) Brute force
22. A binary tree whose every node has either zero or two children is called :  
(A) Binary search tree  
(B) Extended binary tree  
(C) Complete binary tree  
(D) Skewed binary tree
23. For binary search algorithm, which of the following is not a required condition ?  
(A) The list must be sorted  
(B) There must be an easy mechanism to delete and/or insert elements in list  
(C) There should be a direct access to the middle element in any sublist  
(D) None of the above
24. A doubly linked list is :  
(A) A linear data structure  
(B) A non-linear data structure  
(C) Both linear and non-linear data structure  
(D) Neither linear nor non-linear data structure
25. Which is the odd one among the following ?  
(A) Array  
(B) Binary tree  
(C) Complete binary tree  
(D) Graph
26. If a planar graph has  $v$  vertices,  $e$  edges and  $f$  faces, then which of the following is true ?  
(A)  $e + f - v = 2$   
(B)  $e - f + v = 2$   
(C)  $v + e + f = 2$   
(D)  $v - e + f = 2$

27. Given a binary tree with :
- The inorder tree traversal output as : A B C D
  - The preorder tree traversal output as : C B A D

Then the original binary tree is :



28. Consider the undirected weighted graph G with 3 vertices, whose adjacency matrix is given as :

$$G = \begin{bmatrix} 0 & 2 & 2 \\ 2 & 0 & 2 \\ 2 & 2 & 0 \end{bmatrix}$$

Which of the following is true ?

- Graph G has no minimum spanning tree
- Graph G has a unique minimum spanning tree of cost 4
- Graph G has 3 distinct minimum spanning trees, each of cost 4
- Graph H has 3 spanning trees of different costs

29. The travelling salesman problem can be solved using :

- BFS traversal
- A spanning tree
- A minimum spanning tree
- DFS traversal

30. A complete binary tree has depth, given by the formula (where  $n$  is the number nodes) :

- (A)  $n \log_2 n$
- (B)  $\log_2 n$
- (C)  $\log_2 (n + 1)$
- (D)  $n \log_2 n + 1$

31. Let  $\Sigma = \{a, b\}$ ,  $\Gamma = \{a, b, c\}$  and define ' $h$ ' by :

$$h(a) = ab$$

$$h(b) = bbc$$

Then  $h(aba) = abbbcab$

The homomorphic image of

$$L = \{aa, aba\}$$

is the language ..... .

- (A)  $h(L) = \{abab, abbbcab\}$
- (B)  $h(L) = \{abab, abbbcab, aaaa\}$
- (C)  $h(L) = \{abab, abbbcab, bbbb\}$
- (D)  $h(L) = \{abb, abcab\}$

32. Determine the regular expression for the language accepted by  $L_1/L_2$  for  $L_1 = L(a^*baa^*)$ ,  $L_2 = (ab^*)$  :

- (A)  $a^*ba^*$
- (B)  $aba^*$
- (C)  $a^*b^*a^*$
- (D)  $(abc)^*$

33. Determine the context free grammar for the following language where  $n, m \geq 0$  :

$L = \{w \in \{a, b\}^* \mid n_a(v) = n_b(v), \text{ where } v \text{ is any prefix of } w\}$

- (A)  $S \rightarrow A | B$   
 $A \rightarrow aA | aS | \epsilon$   
 $B \rightarrow bB | \epsilon$
- (B)  $S \rightarrow A | B$   
 $A \rightarrow aA | aS | \epsilon$   
 $B \rightarrow bB | bS | \epsilon$
- (C)  $S \rightarrow A | B$   
 $A \rightarrow aA | aB | \epsilon$   
 $B \rightarrow bB | \epsilon$
- (D)  $S \rightarrow A | B$   
 $A \rightarrow aA | SS | \epsilon$   
 $B \rightarrow bB | bA | \epsilon$

34. Which of the following statements are true ?

S<sub>1</sub> : Left recursion is a major problem in top-down parsing and needs to be removed first.

S<sub>2</sub> : Backtracking makes the bottom-up parser delay the input processing.

S<sub>3</sub> : SLR parser has lesser number of states than canonical – LR parser.

S<sub>4</sub> : Canonical – LR parser is more powerful than LALR parser.

(A) S<sub>1</sub> and S<sub>2</sub>

(B) S<sub>1</sub> only

(C) S<sub>1</sub> and S<sub>3</sub>

(D) S<sub>1</sub>, S<sub>3</sub> and S<sub>4</sub>

35. What does Russell's paradox challenge in set theory ?

(A) Axioms of infinity

(B) Axioms of choice

(C) Axioms of regularity

(D) Axioms of foundation

36. Which one of the following is not decidable ?

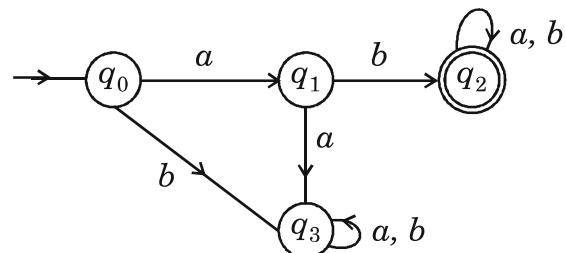
(A) Given a Turing machine M, a string S and an integer K, M accepts S with K step S

(B) Equivalence of two given Turing machines

(C) Language accepted by a given DFSA is non-empty

(D) Language generated by a CFG is non-empty

37. Determine the language accepted by the following deterministic finite accepter over  $\Sigma = \{a, b\}$  :



(A) A language that recognizes the set of all strings on  $\Sigma = \{a, b\}$  starting with prefix 'ab'

(B) A language that recognizes the set of all strings on  $\Sigma = \{a, b\}$  starting with 'ab'

(C) A language that recognizes the set of all strings on  $\Sigma = \{a, b\}$  starting with 'a' or 'b'

(D) A language that recognizes the set of all strings on  $\Sigma = \{a, b\}$  starting with any number of 'as'

38. Which of the following is a characteristic of recursive descent parsing ?
- (A) Backtracking
  - (B) Memoization
  - (C) Ambiguity
  - (D) Shift-Reduce conflicts
39. In an S-attributed definition, what distinguishes synthesized attributes from inherited attributes ?
- (A) Synthesized attributes are computed bottom-up and inherited attributes are computed top-down
  - (B) Inherited attributes are computed bottom-up and synthesized attributes are computed top-down
  - (C) Inherited attributes depend only on synthesized attributes
  - (D) Synthesized attributes depend only on inherited attributes
40. In peephole optimization, what is loop unrolling aimed at achieving ?
- (A) Reducing the number of loops
  - (B) Eliminating conditional statements within loops
  - (C) Decreasing the size of loops by removing redundant instructions
  - (D) Expanding the body of a loop to reduce overhead and improve parallelism
41. The ..... is a program that runs on computer and servers that allows computer to communicate over a network.
- (A) System Software
  - (B) Application Software
  - (C) Windows Operating System
  - (D) Network Operating System
42. Determine the line speed for a 20-channel PCM/TDM system with a 8-kHz sample rate, 10 bits per sample and one framing bit per frame.
- (A) 1.608 Mbps
  - (B) 1.204 Mbps
  - (C) 3.406 Mbps
  - (D) 1.2 Mbps

43. In dual cable system to transmit a data a computer outputs the data on to cable 1, which runs to the device called the ..... at the root of the cable tree.
- (A) tail end  
(B) after one hop  
(C) head end  
(D) round trip
44. What is the broad band frequency in telephone network ?
- (A) 4 kHz  
(B) 3 kHz  
(C) 2 kHz  
(D) 1 kHz
45. In wireless networks CDPD stands for .....
- (A) Carrier Data Packet Data  
(B) Collision Detection in Packet Data  
(C) Cellular Digital Packet Distribution  
(D) Cellular Digital Packet Data
46. Which device is used to connect different networks that provide necessary translation both in terms of hardware and software ?
- (A) Switches  
(B) Routers  
(C) Hubs  
(D) Gateways
47. What is the bit pattern obtained for the sequence of bits 10110101 was sent in even parity by adding a bit at the end ?
- (A) 101101011  
(B) 101101010  
(C) 001101010  
(D) 001101011
48. In computer networks, Pulse Code Modulation (PCM) method is used for digitizing analog voice signals usually samples, the incoming voice signal once every ..... microseconds.
- (A) 75  
(B) 125  
(C) 175  
(D) 225
49. What is the fixed-size blocks used by Trivial File Transfer Protocol to transfer the data ?
- (A) 128 bytes  
(B) 256 bytes  
(C) 512 bytes  
(D) 1024 bytes

50. What are the highly stable and highly volatile values that are assigned to the information in Time-to-live field ?
- (A) 86400 and 60  
(B) 36000 and 0  
(C) 128000 and 128  
(D) 120000 and 60
51. In LISP the function that provides the initial element of a list is :
- (A) Car  
(B) Set  
(C) Second  
(D) First
52. In neural network, the network capacity is defined as :
- (A) The traffic (tarry capacity of network)  
(B) The total number of nodes in the network  
(C) The number of patterns that can be stored and recalled in a network  
(D) The numbers of computes in a network
53. What term describes the scenario where the training error of a model decreases while the test error increases ?
- (A) Over fitting  
(B) Under fitting  
(C) Testing error  
(D) Proper fitting
54. What is Coreference Resolution ?
- (A) Anaphora Resolution  
(B) Given a sentence or larger chunk of text determine which words (mentions) refer to the same objects (entities)  
(C) Solution obtained through coreference  
(D) Solution of a previous solved problem
55. ..... is the type of morphology that changes the word category and affect the meaning.
- (A) Inflectional  
(B) Derivational  
(C) Cliticization  
(D) Infuational

56. Consider the following statements :

**Statement (1) :** In the logistic regression model we pass the values of  $W \cdot x + b$  (for every  $x$  in the dot set) through a sigmoid function to return a probabilistic class label.

**Statement (2) :** In the logistic regression model, if the value  $(W \cdot x + b)$  given to the sigmoid function is close to zero. Then the class label predicted (with a 0.5 threshold) is very certain and reliable.

- (A) Only (1) is correct
- (B) Only (2) is correct
- (C) Both (1) and (2) are correct
- (D) Neither (1) nor (2) is correct

57. A general fuzzy controller consists of .....

- (A) Fuzzy rule base, fuzzy inference engine and fuzzification/defuzzification modules
- (B) Fuzzy functions, fuzzy inference engine and fuzzification/defuzzification modules
- (C) Fuzzy rule base, fuzzy data engine and fuzzification/defuzzification modules
- (D) Fuzzy functions, fuzzy data engine and fuzzification/defuzzification modules

58. Which of the following is not a correct encoding technique used in genetic algorithms ?

- (A) Premier encoding
- (B) Tree encoding
- (C) Binary encoding
- (D) Value encoding

59. A neuron has five inputs given by  $I = \{1, 3, 2, -1, 3\}$  and corresponding weights are  $W = \{0.5, 2, -1, 2, -0.5\}$ . The bias  $b = 0$  and slope parameter  $\alpha = 1$ . The sigmoid activation function is used to generate final output  $y$ . What is the value of  $y$  ?
- (A) -1  
(B) 0.52  
(C) 0.73  
(D) 0.92
60. Which among the following minimizes the upper bound of the generalization error and maximizes the margin between a separating hyperplane and the training data, instead of minimizing the training error ?
- (A) Boltzmann machine  
(B) SVM  
(C) Hopfield neural network  
(D) RBF

61. The inference rule deals exclusively with formulas in conjunctive normal forms is called as :
- (A) Resolution rule  
(B) Contingency rule  
(C) Unsatisfiability rule  
(D) Contradiction rule
62. Let  $A$  and  $B$  be the sets. The symmetric difference between  $A$  and  $B$  is :
- (A)  $A \oplus B = (A - B) \cup (B - A)$   
(B)  $A \cup B = (A \oplus B) \cap (B + A)$   
(C)  $A \cap B = (B + A) - (B - A)$   
(D)  $A \subseteq B = (A - B) \cup (B + A)$

63. A deck of playing cards contains 52 cards, 4 each with face values in the set {A, 2, 3, 4, 5, 6, 7, 8, 9, 10, J, Q, K}. Let us define face values of the top and bottom cards as X and Y. The shuffling algorithm is defined as follows :

**Sh1 :** Permute the cards randomly due to that each arrangement occurs with probability  $1/52!$

**Sh2 :** If  $X \neq Y$ , flip the biased coin that comes up heads with probability P and go back to Sh1 if heads turns up otherwise stop.

Each coin flip and each permutation is assumed to be independent of all the other randomization. What value of P will make X and Y independent random variables once this process of shuffling will stops ?

- (A)  $P = 1/4$
- (B)  $P = 2/3$
- (C)  $P = 1/3$
- (D)  $P = 1/5$

64. Identify the number of distinct string of length 2 of the combinations of blue and yellow beads. The both ends of the strings are not marked due to this they are indistinguishable if interchanging the ends of one will results other. Denote b and y as a blue and yellow beads. Let us consider bb, by, yb and yy are the four different strings of length 2 when equivalence between strings is not taken into the consideration. The number of equivalent classes into which the set  $s = (bb, by, yb, yy)$  is divided by equivalent relation induced by the group of permutation  $[\{\Pi_1, \Pi_2\}, 0]$  where :

$$\Pi_1 = \begin{pmatrix} bb & by & yb & yy \\ bb & by & yb & yy \end{pmatrix}$$

$$\Pi_2 = \begin{pmatrix} bb & by & yb & yy \\ bb & yb & by & yy \end{pmatrix}$$

- (A) 3
- (B) 4
- (C) 5
- (D) 6

65. Design a K-Map for  $F(x, y, z) = x\bar{z} + xy\bar{z} + y\bar{z}$  of  $F(x, y, z)$  and find prime implicants.

- (A)  $xy, y\bar{z}, x\bar{z}$
- (B)  $x, y, z$
- (C)  $\bar{x}y, yz, x\bar{z}$
- (D)  $x\bar{y}, yz, \bar{x}z$

66. 11 students plan to have dinner together for multiple days. They will be seated at the round table. Their plan is to ensure that each student sits next to different neighbours at every dinner. How many days can this arrangement be sustained ?

- (A) 5
- (B) 11
- (C) 4
- (D) 7

67. Explore all 5 letter combinations formed using the letters  $a$  through  $h$ . How many of these words contains no repeats, also do not include the subword “bad” ?

- (A) 6660
- (B) 6667
- (C) 6578
- (D) 6312

68. Suppose  $G$  is the graph with  $n$  vertices such that every vertex having degree 5. What is the smallest value of  $n$  for which graph might be planar ?

- (A)  $\frac{5n}{2}$
- (B)  $5n$
- (C)  $2n$
- (D)  $\frac{2n}{5}$

69. Let us consider the full Coca-Cola bottles, 7 half-full and 7 empty. You want to divide the 21 bottles among three persons so that each will receive exactly 7. Moreover, each person must receive the same quantity of Coca-Cola. Solve the problem using Integer Linear programming and find a solution.  
What will be the objective function ?  
(A) There will be a dummy objective function with all zero coefficients.

| Status    | Number of bottles assigned to person |   |   |
|-----------|--------------------------------------|---|---|
|           | 1                                    | 2 | 3 |
| Full      | 1                                    | 3 | 3 |
| Half-full | 5                                    | 1 | 1 |
| Empty     | 1                                    | 3 | 3 |

- (B) Objective function will be maximize the total quantity of Coca-Cola distribution.

| Status    | Number of bottles assigned to person |   |   |
|-----------|--------------------------------------|---|---|
|           | 1                                    | 2 | 3 |
| Full      | 3                                    | 1 | 2 |
| Half-full | 2                                    | 1 | 3 |
| Empty     | 2                                    | 5 | 1 |

- (C) Objective function will be minimize the empty bottles.

| Status    | Number of bottles assigned to person |   |   |
|-----------|--------------------------------------|---|---|
|           | 1                                    | 2 | 3 |
| Full      | 0                                    | 1 | 2 |
| Half-full | 0                                    | 1 | 3 |
| Empty     | 7                                    | 5 | 2 |

- (D) Set of a binary variable is represented for full bottle representation.

| Status    | Number of bottles assigned to person |   |   |
|-----------|--------------------------------------|---|---|
|           | 1                                    | 2 | 3 |
| Full      | 1                                    | 5 | 2 |
| Half-full | 2                                    | 1 | 2 |
| Empty     | 4                                    | 1 | 3 |

70. Consider the following linear programming problem :

$$\text{Maximize } Z = 2x_1 + 3x_2$$

$$\text{Subject to : } x_1 + 3x_2 \leq 12$$

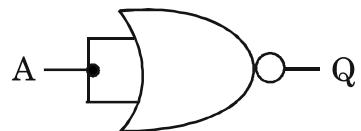
$$3x_1 + 2x_2 \leq 12$$

$$x_1, x_2 \geq 0$$

At which points of graphical solution space the infeasible basic optimum solutions are represented ?

- (A) Corner points ( $x_1 = 0, x_2 = 6$ ) and ( $x_1 = 12, x_2 = 0$ ) are infeasible
- (B) Corner points ( $x_1 = 10.29, x_2 = 2$ ) and ( $x_1 = 0, x_2 = 3.34$ ) are infeasible
- (C) Corner points ( $x_1 = 12.20, x_2 = 6$ ) and ( $x_1 = 0, x_2 = 5.24$ ) are infeasible
- (D) None of the corner points are infeasible

71. Given Logic Gate represents which of the following Truth Table ?



|     | <b>A</b> | <b>Q</b> |
|-----|----------|----------|
| (A) | 0        | 0        |
|     | 1        | 0        |

|     | <b>A</b> | <b>Q</b> |
|-----|----------|----------|
| (B) | 0        | 1        |
|     | 1        | 1        |

|     | <b>A</b> | <b>Q</b> |
|-----|----------|----------|
| (C) | 0        | 0        |
|     | 1        | 1        |

|     | <b>A</b> | <b>Q</b> |
|-----|----------|----------|
| (D) | 0        | 1        |
|     | 1        | 0        |

72. “100” is a number in Decimal Number System. What will be its representation in Octal Number System ?
- (A) 100
  - (B) 144
  - (C) 414
  - (D) 441

73. The following Truth Table represents which Logical Micro-operation ?

| A | B | F |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

- (A)  $F \leftarrow A \wedge B$
- (B)  $F \leftarrow \overline{A \wedge B}$
- (C)  $F \leftarrow A \oplus B$
- (D)  $F \leftarrow \overline{A \oplus B}$

74. Which of the following is not expected from a clock pulse in CPU ?

- (A) It is not applied to all registers.
- (B) It changes the state of registers as per control signal requirements.
- (C) It allows synchronization of various activities.
- (D) It may trigger the loading of data into registers or the transfer of data between registers.

75. Which of the following task is performed by Direct Memory Access (DMA) in a computer system ?

- (A) allow data transfer between a storage unit and CPU independent of memory
- (B) allow data transfer between a storage unit and main memory independent of CPU
- (C) allow data transfer between a storage unit and main memory under CPU control
- (D) allow data transfer between CPU and main memory independent of a storage unit

76. Which of the following statements is not true with respect to a Hardwired Control Unit in comparison with a Micro-programmed Control Unit ?

- (A) It does not require control memory
- (B) It provides better execution speed
- (C) It enables a simpler control unit design
- (D) It does not allow for flexible control unit design

77. Stack Pointer Register (SP) in x86 architecture is generally used to ..... .
- (A) point base of the stack
  - (B) point top of the stack
  - (C) point top or based of the stack based on opcode
  - (D) point top or based of the stack based on addressing mode
78. Which of the following computer systems is represented when a computer can process several programs at the same time ?
- (A) Single Instruction Stream, Single Data Stream (SISD)
  - (B) Single Instruction Stream, Multiple Data Stream (SIMD)
  - (C) Multiple Instruction Stream, Single Data Stream (MISD)
  - (D) Multiple Instruction Stream, Multiple Data Stream (MIMD)
79. Which Redundant Array of Independent Disks (RAID) technology maintains copy of an entire hard disk on other hard disk ?
- (A) RAID 0
  - (B) RAID 1
  - (C) RAID 5
  - (D) RAID 10
80. Which type of memory allows computer system to execute computer programs requiring more memory than physically available ?
- (A) Auxiliary Memory
  - (B) Associative Memory
  - (C) Cache Memory
  - (D) Virtual Memory

81. What is the difference between a “shallow copy” and a “deep copy” in the context of programming languages ?
- (A) Shallow copy duplicates only references, while deep copy duplicates entire object
- (B) Shallow copy duplicates entire object, while deep copy duplicates only references
- (C) Shallow copy duplicates only system variables, whereas deep copy duplicated user defined variables
- (D) Shallow copy duplicates only user defined variables, whereas deep copy duplicated system variables

82. The term “snapshot” is used in the context of virtualization to refer to ..... .
- (A) Backup of virtual machine’s current state
- (B) Backup of host operating system’s current state
- (C) Backup of guest operating system’s current state
- (D) Backup of guest applications current state
83. Predict the output of the following source code in C language :
- ```
int main( )
{
    int i, x[5];
    for(i=0; i<5; i++) * (x+i) = i;
    for(i=0; i<5; i++) printf("%d", x[i]);
    return 0;
}
```
- (A) 0 1 2 3 4
- (B) Syntax Error
- (C) Semantic Error
- (D) Garbage Value

84. Predict the output of the following

C source code :

```
int x = 10;
```

```
int main( )
```

```
{
```

```
    int x = 20;
```

```
{
```

```
    int x = 30;
```

```
{extern x; printf("%d", x);}
```

```
}
```

```
return 0;
```

```
}
```

(A) 10

(B) 20

(C) 30

(D) 10 20 30

85. class C {

public:

```
void f(int a) {cout << a;}
```

```
void f(int a, int b) {cout << a+b;};
```

```
void f(int a, int b, int c) {cout
<< a+b+c;}
```

```
};
```

```
int main( )
```

```
{
```

```
    C obj;
```

```
    obj.f(10);
```

```
    obj.f(10, 20);
```

```
    obj.f(10, 20, 30);
```

```
    return 0;
```

```
}
```

The above C++ source code exemplifies which of the following principle with respect to object-oriented programming ?

(A) Abstraction

(B) Encapsulation

(C) Inheritance

(D) Polymorphism

86. Predict the output of this source code written in C++ language :

```
class C1{
public:
    void display() {cout<<"Hello";}
};

class C2; public C1{
public:
    void display() {cout<<"World";}
};

int main(void) {
    C1*ptr = new C2;
    ptr->display();
    return 0;
}

(A) Hello
(B) World
(C) Hello World
(D) World Hello
```

87. Which of the following activities is not an application of XML ?

```
(A) Data storage
(B) Data transmission
(C) Multiple rendering of the same data
(D) Interaction with the user to get the data
```

88. Which of the following statements is not true with respect to Applets ?

- (A) All web browsers support Applets
- (B) Applets are vulnerable from security perspective
- (C) Applets can communicate with their server on their own
- (D) Applets can play multimedia on client side

89. A transformation that distorts the shape of an object such that the transformed shape appears as if the object was composed of internal layers that had been caused to slide over each other is called as

- (A) Reflection
- (B) Shear
- (C) Dither
- (D) Translation

90. Which of the following materials has highest spectacular reflection coefficient at an angle of 45° of incidence over it ?

- (A) Water
- (B) Glass
- (C) Gold
- (D) Silver

91. Which of the following commands is used to save any transaction permanently into the database ?
- (A) Redo
(B) Commit
(C) Rollback
(D) Undo
92. The maximum number of children that a B-tree of order m can have :
- (A) $m + 1$
(B) $m - 1$
(C) m
(D) $2m$
93. Which of the following commands can be used SQL to delete all the records in the table work ?
- (A) Delete from work
(B) Delete from work where Id = 'Null'
(C) Remove table work
(D) Drop table work
94. A database is :
- (A) an organized collection of data or information that can be only accessed
(B) an organized collection of data or information that can be only managed
(C) an organized collection of data or information that can be accessed, updated and managed
(D) an organized collection of data or information that cannot be updated
95. The data contained in the data warehouse is described by :
- (A) Relational data
(B) Meta data
(C) Operational data
(D) Active data
96. An advantage of distributed database over a centralized database :
- (A) Modular growth
(B) Software cost
(C) Software complexity
(D) Slow response

97. In the context of functional dependency, Armstrong inference rules refer to :
- (A) Reflexivity, Decomposition and Transitivity
 - (B) Decomposition and Transitivity
 - (C) Transitivity, Augmentation and Reflexivity
 - (D) Decomposition and Reflexivity
98. For the SQL query given below :
- ```
SELECT employee_name
FROM employee
WHERE salary BETWEEN 70000
and 130000
```
- Select the equivalent in SQL without BETWEEN operator :
- (A) `SELECT employee_name  
 FROM employee  
 WHERE salary > 70000 and  
 salary < 130000`
  - (B) `SELECT employee_name  
 FROM employee  
 WHERE salary = 70000 and  
 salary = 130000`
  - (C) `SELECT employee_name  
 FROM employee  
 WHERE salary >= 70000 and  
 salary <= 130000`
  - (D) `SELECT employee_name  
 FROM employee  
 WHERE salary < 70000 and  
 salary > 130000`
99. A transaction enters into its partially committed state :
- (A) When it finishes the execution of final statement
  - (B) When it starts the execution of first statement
  - (C) After writing ‘COMMIT’ into log
  - (D) It never enters partially committed state
100. Consider the relation scheme (M, N, O, P, Q, R) with the following set of functional dependencies :
- $$F = \{MO \rightarrow PQ, MPR \rightarrow NO\}$$
- Which of the following is the trivial functional dependencies in  $F^+$ , where  $F^+$  is closure of F ?
- (A)  $MO \rightarrow PQ$
  - (B)  $MO \rightarrow OP$
  - (C)  $MP \rightarrow P$
  - (D)  $MPR \rightarrow N$

## **Computer Science and Applications**

### **Paper II**

**Time Allowed : 120 Minutes]**

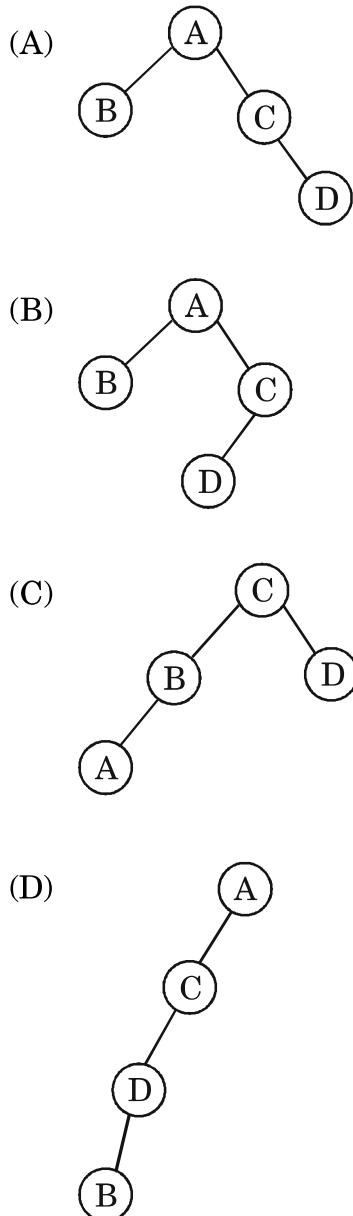
**[Maximum Marks : 200**

**Note :** This paper contains **Hundred (100)** multiple choice questions. Each question carrying **Two (2)** marks. Attempt *All* questions.

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1. The Merger sort algorithm employs the design technique :</p> <p>(A) Backtracking<br/>(B) Dynamic programming<br/>(C) Divide and Conquer<br/>(D) Brute force</p> <p>2. A binary tree whose every node has either zero or two children is called :</p> <p>(A) Binary search tree<br/>(B) Extended binary tree<br/>(C) Complete binary tree<br/>(D) Skewed binary tree</p> <p>3. For binary search algorithm, which of the following is not a required condition ?</p> <p>(A) The list must be sorted<br/>(B) There must be an easy mechanism to delete and/or insert elements in list<br/>(C) There should be a direct access to the middle element in any sublist<br/>(D) None of the above</p> | <p>4. A doubly linked list is :</p> <p>(A) A linear data structure<br/>(B) A non-linear data structure<br/>(C) Both linear and non-linear data structure<br/>(D) Neither linear nor non-linear data structure</p> <p>5. Which is the odd one among the following ?</p> <p>(A) Array<br/>(B) Binary tree<br/>(C) Complete binary tree<br/>(D) Graph</p> <p>6. If a planar graph has <math>v</math> vertices, <math>e</math> edges and <math>f</math> faces, then which of the following is true ?</p> <p>(A) <math>e + f - v = 2</math><br/>(B) <math>e - f + v = 2</math><br/>(C) <math>v + e + f = 2</math><br/>(D) <math>v - e + f = 2</math></p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

7. Given a binary tree with :
- The inorder tree traversal output as : A B C D
  - The preorder tree traversal output as : C B A D

Then the original binary tree is :



8. Consider the undirected weighted graph G with 3 vertices, whose adjacency matrix is given as :

$$G = \begin{bmatrix} 0 & 2 & 2 \\ 2 & 0 & 2 \\ 2 & 2 & 0 \end{bmatrix}$$

Which of the following is true ?

- Graph G has no minimum spanning tree
  - Graph G has a unique minimum spanning tree of cost 4
  - Graph G has 3 distinct minimum spanning trees, each of cost 4
  - Graph H has 3 spanning trees of different costs
9. The travelling salesman problem can be solved using :
- BFS traversal
  - A spanning tree
  - A minimum spanning tree
  - DFS traversal

10. A complete binary tree has depth, given by the formula (where  $n$  is the number nodes) :

- (A)  $n \log_2 n$
- (B)  $\log_2 n$
- (C)  $\log_2 (n + 1)$
- (D)  $n \log_2 n + 1$

11. Let  $\Sigma = \{a, b\}$ ,  $\Gamma = \{a, b, c\}$  and define ' $h$ ' by :

$$h(a) = ab$$

$$h(b) = bbc$$

Then  $h(aba) = abbbcab$

The homomorphic image of

$$L = \{aa, aba\}$$

is the language ..... .

- (A)  $h(L) = \{abab, abbbcab\}$
- (B)  $h(L) = \{abab, abbbcab, aaaa\}$
- (C)  $h(L) = \{abab, abbbcab, bbbb\}$
- (D)  $h(L) = \{abb, abcab\}$

12. Determine the regular expression for the language accepted by  $L_1/L_2$  for  $L_1 = L(a^*baa^*)$ ,  $L_2 = (ab)^*$  :

- (A)  $a^*ba^*$
- (B)  $aba^*$
- (C)  $a^*b^*a^*$
- (D)  $(abc)^*$

13. Determine the context free grammar for the following language where  $n, m \geq 0$  :

$L = \{w \in \{a, b\}^* \mid n_a(v) = n_b(v), \text{ where } v \text{ is any prefix of } w\}$

- (A)  $S \rightarrow A | B$ 
  - $A \rightarrow aA | aS | \epsilon$
  - $B \rightarrow bB | \epsilon$
- (B)  $S \rightarrow A | B$ 
  - $A \rightarrow aA | aS | \epsilon$
  - $B \rightarrow bB | bS | \epsilon$
- (C)  $S \rightarrow A | B$ 
  - $A \rightarrow aA | aB | \epsilon$
  - $B \rightarrow bB | \epsilon$
- (D)  $S \rightarrow A | B$ 
  - $A \rightarrow aA | SS | \epsilon$
  - $B \rightarrow bB | bA | \epsilon$

14. Which of the following statements are true ?

S<sub>1</sub> : Left recursion is a major problem in top-down parsing and needs to be removed first.

S<sub>2</sub> : Backtracking makes the bottom-up parser delay the input processing.

S<sub>3</sub> : SLR parser has lesser number of states than canonical – LR parser.

S<sub>4</sub> : Canonical – LR parser is more powerful than LALR parser.

(A) S<sub>1</sub> and S<sub>2</sub>

(B) S<sub>1</sub> only

(C) S<sub>1</sub> and S<sub>3</sub>

(D) S<sub>1</sub>, S<sub>3</sub> and S<sub>4</sub>

15. What does Russell's paradox challenge in set theory ?

(A) Axioms of infinity

(B) Axioms of choice

(C) Axioms of regularity

(D) Axioms of foundation

16. Which one of the following is not decidable ?

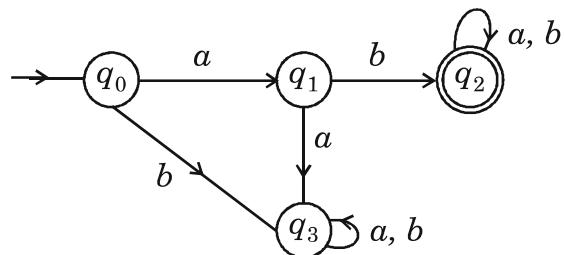
(A) Given a Turing machine M, a string S and an integer K, M accepts S with K step S

(B) Equivalence of two given Turing machines

(C) Language accepted by a given DFSA is non-empty

(D) Language generated by a CFG is non-empty

17. Determine the language accepted by the following deterministic finite accepter over  $\Sigma = \{a, b\}$  :



(A) A language that recognizes the set of all strings on  $\Sigma = \{a, b\}$  starting with prefix 'ab'

(B) A language that recognizes the set of all strings on  $\Sigma = \{a, b\}$  starting with 'ab'

(C) A language that recognizes the set of all strings on  $\Sigma = \{a, b\}$  starting with 'a' or 'b'

(D) A language that recognizes the set of all strings on  $\Sigma = \{a, b\}$  starting with any number of 'as'

18. Which of the following is a characteristic of recursive descent parsing ?
- (A) Backtracking
  - (B) Memoization
  - (C) Ambiguity
  - (D) Shift-Reduce conflicts
19. In an S-attributed definition, what distinguishes synthesized attributes from inherited attributes ?
- (A) Synthesized attributes are computed bottom-up and inherited attributes are computed top-down
  - (B) Inherited attributes are computed bottom-up and synthesized attributes are computed top-down
  - (C) Inherited attributes depend only on synthesized attributes
  - (D) Synthesized attributes depend only on inherited attributes
20. In peephole optimization, what is loop unrolling aimed at achieving ?
- (A) Reducing the number of loops
  - (B) Eliminating conditional statements within loops
  - (C) Decreasing the size of loops by removing redundant instructions
  - (D) Expanding the body of a loop to reduce overhead and improve parallelism
21. The ..... is a program that runs on computer and servers that allows computer to communicate over a network.
- (A) System Software
  - (B) Application Software
  - (C) Windows Operating System
  - (D) Network Operating System

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>22. Determine the line speed for a 20-channel PCM/TDM system with a 8-kHz sample rate, 10 bits per sample and one framing bit per frame.</p> <p>(A) 1.608 Mbps<br/>(B) 1.204 Mbps<br/>(C) 3.406 Mbps<br/>(D) 1.2 Mbps</p> <p>23. In dual cable system to transmit a data a computer outputs the data on to cable 1, which runs to the device called the ..... at the root of the cable tree.</p> <p>(A) tail end<br/>(B) after one hop<br/>(C) head end<br/>(D) round trip</p> <p>24. What is the broad band frequency in telephone network ?</p> <p>(A) 4 kHz<br/>(B) 3 kHz<br/>(C) 2 kHz<br/>(D) 1 kHz</p> | <p>25. In wireless networks CDPD stands for ..... .</p> <p>(A) Carrier Data Packet Data<br/>(B) Collision Detection in Packet Data<br/>(C) Cellular Digital Packet Distribution<br/>(D) Cellular Digital Packet Data</p> <p>26. Which device is used to connect different networks that provide necessary translation both in terms of hardware and software ?</p> <p>(A) Switches<br/>(B) Routers<br/>(C) Hubs<br/>(D) Gateways</p> <p>27. What is the bit pattern obtained for the sequence of bits 10110101 was sent in even parity by adding a bit at the end ?</p> <p>(A) 101101011<br/>(B) 101101010<br/>(C) 001101010<br/>(D) 001101011</p> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

28. In computer networks, Pulse Code Modulation (PCM) method is used for digitizing analog voice signals usually samples, the incoming voice signal once every ..... microseconds.
- (A) 75  
(B) 125  
(C) 175  
(D) 225
29. What is the fixed-size blocks used by Trivial File Transfer Protocol to transfer the data ?
- (A) 128 bytes  
(B) 256 bytes  
(C) 512 bytes  
(D) 1024 bytes
30. What are the highly stable and highly volatile values that are assigned to the information in Time-to-live field ?
- (A) 86400 and 60  
(B) 36000 and 0  
(C) 128000 and 128  
(D) 120000 and 60
31. In LISP the function that provides the initial element of a list is :
- (A) Car  
(B) Set  
(C) Second  
(D) First
32. In neural network, the network capacity is defined as :
- (A) The traffic (tarry capacity of network)  
(B) The total number of nodes in the network  
(C) The number of patterns that can be stored and recalled in a network  
(D) The numbers of computes in a network
33. What term describes the scenario where the training error of a model decreases while the test error increases ?
- (A) Over fitting  
(B) Under fitting  
(C) Testing error  
(D) Proper fitting

34. What is Coreference Resolution ?
- (A) Anaphora Resolution
  - (B) Given a sentence or larger chunk of text determine which words (mentions) refer to the same objects (entities)
  - (C) Solution obtained through coreference
  - (D) Solution of a previous solved problem
35. ..... is the type of morphology that changes the word category and affect the meaning.
- (A) Inflectional
  - (B) Derivational
  - (C) Cliticization
  - (D) Infuational

36. Consider the following statements :

**Statement (1) :** In the logistic regression model we pass the values of  $W \cdot x + b$  (for every  $x$  in the dot set) through a sigmoid function to return a probabilistic class label.

**Statement (2) :** In the logistic regression model, if the value  $(W \cdot x + b)$  given to the sigmoid function is close to zero. Then the class label predicted (with a 0.5 threshold) is very certain and reliable.

- (A) Only (1) is correct
- (B) Only (2) is correct
- (C) Both (1) and (2) are correct
- (D) Neither (1) nor (2) is correct

37. A general fuzzy controller consists of ..... .
- (A) Fuzzy rule base, fuzzy inference engine and fuzzification/defuzzification modules
- (B) Fuzzy functions, fuzzy inference engine and fuzzification/defuzzification modules
- (C) Fuzzy rule base, fuzzy data engine and fuzzification/defuzzification modules
- (D) Fuzzy functions, fuzzy data engine and fuzzification/defuzzification modules
38. Which of the following is not a correct encoding technique used in genetic algorithms ?
- (A) Premier encoding
- (B) Tree encoding
- (C) Binary encoding
- (D) Value encoding
39. A neuron has five inputs given by  $I = \{1, 3, 2, -1, 3\}$  and corresponding weights are  $W = \{0.5, 2, -1, 2, -0.5\}$ . The bias  $b = 0$  and slope parameter  $\alpha = 1$ . The sigmoid activation function is used to generate final output  $y$ . What is the value of  $y$  ?
- (A) -1
- (B) 0.52
- (C) 0.73
- (D) 0.92
40. Which among the following minimizes the upper bound of the generalization error and maximizes the margin between a separating hyperplane and the training data, instead of minimizing the training error ?
- (A) Boltzmann machine
- (B) SVM
- (C) Hopfield neural network
- (D) RBF

41. The inference rule deals exclusively with formulas in conjunctive normal forms is called as :

- (A) Resolution rule
- (B) Contingency rule
- (C) Unsatisfiability rule
- (D) Contradiction rule

42. Let A and B be the sets. The symmetric difference between A and B is :

- (A)  $A \oplus B = (A - B) \cup (B - A)$
- (B)  $A \cup B = (A \oplus B) \cap (B + A)$
- (C)  $A \cap B = (B + A) - (B - A)$
- (D)  $A \subseteq B = (A - B) \cup (B + A)$

43. A deck of playing cards contains 52 cards, 4 each with face values in the set {A, 2, 3, 4, 5, 6, 7, 8, 9, 10, J, Q, K}. Let us define face values of the top and bottom cards as X and Y. The shuffling algorithm is defined as follows :

**Sh1** : Permute the cards randomly due to that each arrangement occurs with probability  $1/52$  !

**Sh2** : If  $X \neq Y$ , flip the biased coin that comes up heads with probability P and go back to Sh1 if heads turns up otherwise stop.

Each coin flip and each permutation is assumed to be independent of all the other randomization. What value of P will make X and Y independent random variables once this process of shuffling will stops ?

- (A)  $P = 1/4$
- (B)  $P = 2/3$
- (C)  $P = 1/3$
- (D)  $P = 1/5$

44. Identify the number of distinct string of length 2 of the combinations of blue and yellow beads. The both ends of the strings are not marked due to this they are indistinguishable if interchanging the ends of one will results other. Denote  $b$  and  $y$  as a blue and yellow beads. Let us consider  $bb$ ,  $by$ ,  $yb$  and  $yy$  are the four different strings of length 2 when equivalence between strings is not taken into the consideration. The number of equivalent classes into which the set  $s = (bb, by, yb, yy)$  is divided by equivalent relation induced by the group of permutation  $[\{\Pi_1, \Pi_2\}, 0]$  where :

$$\Pi_1 = \begin{pmatrix} bb & by & yb & yy \\ bb & by & yb & yy \end{pmatrix}$$

$$\Pi_2 = \begin{pmatrix} bb & by & yb & yy \\ bb & yb & by & yy \end{pmatrix}$$

- (A) 3
- (B) 4
- (C) 5
- (D) 6

45. Design a K-Map for  $F(x, y, z) = x\bar{z} + xyz + y\bar{z}$  of  $F(x, y, z)$  and find prime implicants.

- (A)  $xy, y\bar{z}, x\bar{z}$
- (B)  $x, y, z$
- (C)  $\bar{x}y, yz, x\bar{z}$
- (D)  $x\bar{y}, yz, \bar{x}z$

46. 11 students plan to have dinner together for multiple days. They will be seated at the round table. Their plan is to ensure that each student sits next to different neighbours at every dinner. How many days can this arrangement be sustained ?

- (A) 5
- (B) 11
- (C) 4
- (D) 7

47. Explore all 5 letter combinations formed using the letters  $a$  through  $h$ . How many of these words contains no repeats, also do not include the subword “bad” ?
- (A) 6660  
 (B) 6667  
 (C) 6578  
 (D) 6312
48. Suppose  $G$  is the graph with  $n$  vertices such that every vertex having degree 5. What is the smallest value of  $n$  for which graph might be planar ?
- (A)  $\frac{5n}{2}$   
 (B)  $5n$   
 (C)  $2n$   
 (D)  $\frac{2n}{5}$

49. Let us consider the full Coca-Cola bottles, 7 half-full and 7 empty. You want to divide the 21 bottles among three persons so that each will receive exactly 7. Moreover, each person must receive the same quantity of Coca-Cola. Solve the problem using Integer Linear programming and find a solution.

What will be the objective function ?

(A) There will be a dummy objective function with all zero coefficients.

| Status    | Number of bottles assigned to person |   |   |
|-----------|--------------------------------------|---|---|
|           | 1                                    | 2 | 3 |
| Full      | 1                                    | 3 | 3 |
| Half-full | 5                                    | 1 | 1 |
| Empty     | 1                                    | 3 | 3 |

- (B) Objective function will be maximize the total quantity of Coca-Cola distribution.

| Status    | Number of bottles assigned to person |   |   |
|-----------|--------------------------------------|---|---|
|           | 1                                    | 2 | 3 |
| Full      | 3                                    | 1 | 2 |
| Half-full | 2                                    | 1 | 3 |
| Empty     | 2                                    | 5 | 1 |

- (C) Objective function will be minimize the empty bottles.

| Status    | Number of bottles assigned to person |   |   |
|-----------|--------------------------------------|---|---|
|           | 1                                    | 2 | 3 |
| Full      | 0                                    | 1 | 2 |
| Half-full | 0                                    | 1 | 3 |
| Empty     | 7                                    | 5 | 2 |

- (D) Set of a binary variable is represented for full bottle representation.

| Status    | Number of bottles assigned to person |   |   |
|-----------|--------------------------------------|---|---|
|           | 1                                    | 2 | 3 |
| Full      | 1                                    | 5 | 2 |
| Half-full | 2                                    | 1 | 2 |
| Empty     | 4                                    | 1 | 3 |

50. Consider the following linear programming problem :

$$\text{Maximize } Z = 2x_1 + 3x_2$$

$$\text{Subject to : } x_1 + 3x_2 \leq 12$$

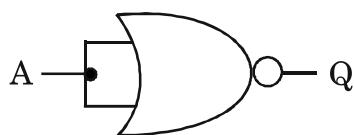
$$3x_1 + 2x_2 \leq 12$$

$$x_1, x_2 \geq 0$$

At which points of graphical solution space the infeasible basic optimum solutions are represented ?

- (A) Corner points ( $x_1 = 0, x_2 = 6$ ) and ( $x_1 = 12, x_2 = 0$ ) are infeasible
- (B) Corner points ( $x_1 = 10.29, x_2 = 2$ ) and ( $x_1 = 0, x_2 = 3.34$ ) are infeasible
- (C) Corner points ( $x_1 = 12.20, x_2 = 6$ ) and ( $x_1 = 0, x_2 = 5.24$ ) are infeasible
- (D) None of the corner points are infeasible

51. Given Logic Gate represents which of the following Truth Table ?



(A)

| A | Q |
|---|---|
| 0 | 0 |
| 1 | 0 |

(B)

| A | Q |
|---|---|
| 0 | 1 |
| 1 | 1 |

(C)

| A | Q |
|---|---|
| 0 | 0 |
| 1 | 1 |

(D)

| A | Q |
|---|---|
| 0 | 1 |
| 1 | 0 |

52. “100” is a number in Decimal Number System. What will be its representation in Octal Number System ?

- (A) 100
- (B) 144
- (C) 414
- (D) 441

53. The following Truth Table represents which Logical Micro-operation ?

| A | B | F |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

(A)  $F \leftarrow A \wedge B$

(B)  $F \leftarrow \overline{A \wedge B}$

(C)  $F \leftarrow A \oplus B$

(D)  $F \leftarrow \overline{A \oplus B}$

54. Which of the following is not expected from a clock pulse in CPU ?

- (A) It is not applied to all registers.
- (B) It changes the state of registers as per control signal requirements.
- (C) It allows synchronization of various activities.
- (D) It may trigger the loading of data into registers or the transfer of data between registers.

55. Which of the following task is performed by Direct Memory Access (DMA) in a computer system ?
- (A) allow data transfer between a storage unit and CPU independent of memory
  - (B) allow data transfer between a storage unit and main memory independent of CPU
  - (C) allow data transfer between a storage unit and main memory under CPU control
  - (D) allow data transfer between CPU and main memory independent of a storage unit
56. Which of the following statements is not true with respect to a Hardwired Control Unit in comparison with a Micro-programmed Control Unit ?
- (A) It does not require control memory
  - (B) It provides better execution speed
  - (C) It enables a simpler control unit design
  - (D) It does not allow for flexible control unit design
57. Stack Pointer Register (SP) in x86 architecture is generally used to .....
- (A) point base of the stack
  - (B) point top of the stack
  - (C) point top or based of the stack based on opcode
  - (D) point top or based of the stack based on addressing mode
58. Which of the following computer systems is represented when a computer can process several programs at the same time ?
- (A) Single Instruction Stream, Single Data Stream (SISD)
  - (B) Single Instruction Stream, Multiple Data Stream (SIMD)
  - (C) Multiple Instruction Stream, Single Data Stream (MISD)
  - (D) Multiple Instruction Stream, Multiple Data Stream (MIMD)

59. Which Redundant Array of Independent Disks (RAID) technology maintains copy of an entire hard disk on other hard disk ?
- (A) RAID 0  
(B) RAID 1  
(C) RAID 5  
(D) RAID 10
60. Which type of memory allows computer system to execute computer programs requiring more memory than physically available ?
- (A) Auxiliary Memory  
(B) Associative Memory  
(C) Cache Memory  
(D) Virtual Memory

61. What is the difference between a “shallow copy” and a “deep copy” in the context of programming languages ?
- (A) Shallow copy duplicates only references, while deep copy duplicates entire object  
(B) Shallow copy duplicates entire object, while deep copy duplicates only references  
(C) Shallow copy duplicates only system variables, whereas deep copy duplicated user defined variables  
(D) Shallow copy duplicates only user defined variables, whereas deep copy duplicated system variables

62. The term “snapshot” is used in the context of virtualization to refer to .....

- (A) Backup of virtual machine’s current state
- (B) Backup of host operating system’s current state
- (C) Backup of guest operating system’s current state
- (D) Backup of guest applications current state

63. Predict the output of the following source code in C language :

```
int main()
{
 int i, x[5];
 for(i=0; i<5; i++) * (x+i) = i;
 for(i=0; i<5; i++) printf("%d", x[i]);
 return 0;
}

(A) 0 1 2 3 4
(B) Syntax Error
(C) Semantic Error
(D) Garbage Value
```

64. Predict the output of the following

C source code :

```
int x = 10;
```

```
int main()
```

```
{
```

```
 int x = 20;
```

```
{
```

```
 int x = 30;
```

```
{extern x; printf("%d", x);}
```

```
}
```

```
return 0;
```

```
}
```

(A) 10

(B) 20

(C) 30

(D) 10 20 30

**APR - 37224/II—D**

65. class C {  
public:  
    void f(int a) {cout << a;}  
    void f(int a, int b) {cout << a+b;}  
    void f(int a, int b, int c) {cout  
                                << a+b+c;}  
};  
int main( )  
{  
    C obj;  
    obj.f(10);  
    obj.f(10, 20);  
    obj.f(10, 20, 30);  
    return 0;  
}

The above C++ source code exemplifies which of the following principle with respect to object-oriented programming ?

- (A) Abstraction
- (B) Encapsulation
- (C) Inheritance
- (D) Polymorphism

66. Predict the output of this source code written in C++ language :

```
class C1{
public:
 void display() {cout<<"Hello";}
};
class C2; public C1{
public:
 void display() {cout<<"World";}
};
int main(void) {
 C1* ptr = new C2;
 ptr->display();
 return 0;
}
```

- (A) Hello
- (B) World
- (C) Hello World
- (D) World Hello

67. Which of the following activities is not an application of XML ?

- (A) Data storage
- (B) Data transmission
- (C) Multiple rendering of the same data
- (D) Interaction with the user to get the data

68. Which of the following statements is not true with respect to Applets ?
- (A) All web browsers support Applets
  - (B) Applets are vulnerable from security perspective
  - (C) Applets can communicate with their server on their own
  - (D) Applets can play multimedia on client side
69. A transformation that distorts the shape of an object such that the transformed shape appears as if the object was composed of internal layers that had been caused to slide over each other is called as ..... .
- (A) Reflection
  - (B) Shear
  - (C) Dither
  - (D) Translation
70. Which of the following materials has highest spectacular reflection coefficient at an angle of  $45^\circ$  of incidence over it ?
- (A) Water
  - (B) Glass
  - (C) Gold
  - (D) Silver
71. Which of the following commands is used to save any transaction permanently into the database ?
- (A) Redo
  - (B) Commit
  - (C) Rollback
  - (D) Undo
72. The maximum number of children that a B-tree of order  $m$  can have :
- (A)  $m + 1$
  - (B)  $m - 1$
  - (C)  $m$
  - (D)  $2m$
73. Which of the following commands can be used SQL to delete all the records in the table work ?
- (A) Delete from work
  - (B) Delete from work where Id = 'Null'
  - (C) Remove table work
  - (D) Drop table work

74. A database is :
- (A) an organized collection of data or information that can be only accessed
  - (B) an organized collection of data or information that can be only managed
  - (C) an organized collection of data or information that can be accessed, updated and managed
  - (D) an organized collection of data or information that cannot be updated
75. The data contained in the data warehouse is described by :
- (A) Relational data
  - (B) Meta data
  - (C) Operational data
  - (D) Active data
76. An advantage of distributed database over a centralized database :
- (A) Modular growth
  - (B) Software cost
  - (C) Software complexity
  - (D) Slow response
77. In the context of functional dependency, Armstrong inference rules refer to :
- (A) Reflexivity, Decomposition and Transitivity
  - (B) Decomposition and Transitivity
  - (C) Transitivity, Augmentation and Reflexivity
  - (D) Decomposition and Reflexivity
78. For the SQL query given below :
- ```
SELECT employee_name  
FROM employee  
WHERE salary BETWEEN 70000  
and 130000
```
- Select the equivalent in SQL without BETWEEN operator :
- (A) SELECT employee_name
FROM employee
WHERE salary > 70000 and
salary < 130000
 - (B) SELECT employee_name
FROM employee
WHERE salary = 70000 and
salary = 130000
 - (C) SELECT employee_name
FROM employee
WHERE salary >= 70000 and
salary <= 130000
 - (D) SELECT employee_name
FROM employee
WHERE salary < 70000 and
salary > 130000

79. A transaction enters into its partially committed state :
- (A) When it finishes the execution of final statement
 - (B) When it starts the execution of first statement
 - (C) After writing ‘COMMIT’ into log
 - (D) It never enters partially committed state
80. Consider the relation scheme (M, N, O, P, Q, R) with the following set of functional dependencies :
- $$F = \{MO \rightarrow PQ, MPR \rightarrow NO\}$$
- Which of the following is the trivial functional dependencies in F^+ , where F^+ is closure of F ?
- (A) MO \rightarrow PQ
 - (B) MO \rightarrow OP
 - (C) MP \rightarrow P
 - (D) MPR \rightarrow N
81. In what tree, for every node the height of its left subtree and right subtree differ at least by one :
- (A) AVL tree
 - (B) Threaded binary tree
 - (C) Binary search tree
 - (D) Complete tree
82. An example of a distributed OS is :
- (A) Amoeba
 - (B) UNIX
 - (C) MS-DOS
 - (D) MULTICS

83. Consider the following proposed solution to dining philosopher’s problem to avoid deadlock. Consider the binary semaphore lock initialized to 1.

```
Philosopher (int i)
{
    while (1)
    {
        think ();
        wait (lock); .........(i)
        wait (fork [i]);
        wait (fork [(i+1)%5]);
        signal (lock); ..... (ii)
        eat();
        wait (lock); ..... (iii)
        signal (fork [i]);
        signal (fork (i + 1) % 5);
        signal (lock); ..... (iv)
    }
}
```

Which of the following is correct ?

- (A) Removing (i) and (ii) will not affect the code. The code will work fine.
- (B) Removing (iii) and (iv) will not affect the code. The code will work fine.
- (C) Removing (i), (ii), (iii), (iv) will not affect the code. The code will work fine.
- (D) All (i), (ii), (iii), (iv) are necessary. Removal of any of them will affect the code.

84. Which of the following type is at lowest level in terms of operating system security ?

(A) Type A

(B) Type B

(C) Type C

(D) Type D

85. The equivalent postfix express for

$d / (e + f) + b * c$ is :

(A) $defbc / ++$

(B) $def + / bc + *$

(C) $def + / bc * +$

(D) $def / ++ bc *$

86. Match the following flag bits used in the context of virtual memory management on the List I (Name of the bit) with the different purposes on the List II (Purpose) of the table mentioned :

List I

(Name of the bit)

(i) Dirty

(ii) R/W

(iii) Reference

(iv) Valid

List II

(Purpose)

(a) Page initialization

(b) Write-back policy

(c) Page protection

(d) Page replacement policy

Codes :

(i) (ii) (iii) (iv)

(A) (d) (a) (b) (c)

(B) (b) (c) (a) (d)

(C) (c) (d) (a) (b)

(D) (b) (c) (d) (a)

87. An operating system contains 3 user processes each requiring 2 unit of resources 'R'. The minimum number of units of 'r' such that no deadlocks will ever arise is :
- (A) 3
(B) 5
(C) 4
(D) 6
88. How much extra space is used by heapsort algorithm ?
- (A) $O(n)$
(B) $O(n^p)$
(C) $O(l)$
(D) $O(\log n)$
89. Consider a non-negative counting semaphore S. The operation $P(s)$ decrements S, and $V(s)$ increments S. During an execution, 20 $P(s)$ operations and 12 $V(s)$ operations are issued in some order. The largest initial value of S for which at least one $P(s)$ operation will remain blocked is :
- (A) 4
(B) 5
(C) 6
(D) 7
90. Where does the swap space reside ?
- (A) RAM
(B) Disk
(C) ROM
(D) On chip cache
91. Which problem exists from the management perspective in the incremental model ?
- (A) System structure tends to improve as new increments are added and performs better.
(B) System structure becomes robust as new increments added.
(C) System structure tends to degrade as new increments are added and performs better.
(D) System structure tends to degrade as new increments are added and regular changes corrupts its structure.
92. In development testing may be simple entities such as functions or object classes, or may be coherent groupings of these entities.
- (A) Components
(B) Table
(C) View
(D) Domain

93. principle expect the system requirements to change and so design the system to accommodate the changes in Agile software development.
- (A) Incremental delivery
(B) People not process
(C) Embrace change
(D) Maintain simplicity
94. The thread of Extreme programming comes from helping build software teams at their start-ups and need to maintain flexibility.
- (A) Second
(B) Fourth
(C) Sixth
(D) Seventh
95. are a requirements discovery technique that were first introduced in the Objectory method.
- (A) Classes
(B) Objects
(C) Functions
(D) Use cases
96. Architectural models that may be developed may include :
..... models that shows relationships, such as data flow, between the sub-systems.
- (A) Static structural
(B) Dynamic process
(C) Interface model
(D) Relationship models
97. ensure the software development team have followed project quality procedures.
- (A) Quality assurance
(B) Quality planning
(C) Quality control
(D) Quality check
98. In COCOMO II model PREX stands for
- (A) Personnel experience
(B) Reliability and complexity
(C) Personnel capability
(D) Personal exchange
99. Who presents the code or document at an inspection meeting ?
- (A) Reader
(B) Inspector
(C) Chief moderator
(D) Author
100. Which is not a factor influencing system release strategy ?
- (A) Technical quality of the system
(B) Platform changes
(C) Lehman's fifth law
(D) Verification

MAHARASHTRA STATE ELIGIBILITY TEST - 7th April 2024
FINAL ANSWER KEY FOR PAPER -I (Booklet Code : A)

QueNo	Answer
1	B
2	C
3	D
4	C
5	C
6	C
7	B
8	B
9	B
10	B
11	C
12	A
13	D
14	B
15	C
16	g
17	B
18	B
19	D
20	D
21	C
22	B
23	B
24	C
25	B
26	B
27	C
28	D
29	A
30	B
31	B
32	B
33	C
34	D
35	C
36	C
37	B
38	D
39	A
40	B
41	C

QueNo	Answer
42	C
43	A
44	C
45	B
46	C
47	A
48	D
49	B
50	C

9 = No option is correct or the question is wrong, a= A and B, b = A and C, c = A and D, d = A,B and C, e = A,B and D,f = A,C and D, g = A,B,C and D, h = B and C, i = B and D, j = B,C and D, k = C and D

MAHARASHTRA STATE ELIGIBILITY TEST - 7th April 2024
FINAL ANSWER KEY FOR PAPER -I (Booklet Code : B)

QueNo	Answer
1	C
2	A
3	D
4	B
5	C
6	g
7	B
8	B
9	D
10	D
11	C
12	B
13	B
14	C
15	B
16	B
17	C
18	D
19	A
20	B
21	B
22	B
23	C
24	D
25	C
26	C
27	B
28	D
29	A
30	B
31	C
32	C
33	A
34	C
35	B
36	C
37	A
38	D
39	B
40	C
41	B

QueNo	Answer
42	C
43	D
44	C
45	C
46	C
47	B
48	B
49	B
50	B

9 = No option is correct or the question is wrong, a= A and B, b = A and C, c = A and D, d = A,B and C, e = A,B and D,f = A,C and D, g = A,B,C and D, h = B and C, i = B and D, j = B,C and D, k = C and D

MAHARASHTRA STATE ELIGIBILITY TEST - 7th April 2024
FINAL ANSWER KEY FOR PAPER -I (Booklet Code : C)

QueNo	Answer
1	C
2	B
3	B
4	C
5	B
6	B
7	C
8	D
9	A
10	B
11	B
12	B
13	C
14	D
15	C
16	C
17	B
18	D
19	A
20	B
21	C
22	C
23	A
24	C
25	B
26	C
27	A
28	D
29	B
30	C
31	B
32	C
33	D
34	C
35	C
36	C
37	B
38	B
39	B
40	B
41	C

QueNo	Answer
42	A
43	D
44	B
45	C
46	g
47	B
48	B
49	D
50	D

9 = No option is correct or the question is wrong, a= A and B, b = A and C, c = A and D, d = A,B and C, e = A,B and D,f = A,C and D, g = A,B,C and D, h = B and C, i = B and D, j = B,C and D, k = C and D

MAHARASHTRA STATE ELIGIBILITY TEST - 7th April 2024
FINAL ANSWER KEY FOR PAPER -I (Booklet Code : D)

QueNo	Answer
1	B
2	B
3	C
4	D
5	C
6	C
7	B
8	D
9	A
10	B
11	C
12	C
13	A
14	C
15	B
16	C
17	A
18	D
19	B
20	C
21	B
22	C
23	D
24	C
25	C
26	C
27	B
28	B
29	B
30	B
31	C
32	A
33	D
34	B
35	C
36	g
37	B
38	B
39	D
40	D
41	C

QueNo	Answer
42	B
43	B
44	C
45	B
46	B
47	C
48	D
49	A
50	B

9 = No option is correct or the question is wrong, a= A and B, b = A and C, c = A and D, d = A,B and C, e = A,B and D,f = A,C and D, g = A,B,C and D, h = B and C, i = B and D, j = B,C and D, k = C and D

MAHARASHTRA STATE ELIGIBILITY TEST - 7th April 2024
FINAL ANSWER KEY FOR PAPER -II (Booklet Code :A)
SUBJECT CODE & NAME: (37) Computer Science & Application

QueNo	Answer
1	A
2	A
3	A
4	A
5	A
6	A
7	A
8	9
9	A
10	A
11	D
12	B
13	C
14	A
15	B
16	C
17	B
18	D
19	B
20	D
21	A
22	A
23	A
24	A
25	D
26	9
27	D
28	A
29	B
30	D
31	B
32	C
33	A
34	C
35	B
36	A
37	C
38	C
39	A
40	C

QueNo	Answer
41	A
42	A
43	B
44	D
45	C
46	D
47	C
48	9
49	D
50	B
51	D
52	A
53	C
54	A
55	D
56	D
57	C
58	A
59	A
60	D
61	C
62	B
63	B
64	A
65	A
66	D
67	C
68	C
69	C
70	C
71	A
72	A
73	C
74	C
75	C
76	B
77	a
78	B
79	D
80	D

QueNo	Answer
81	D
82	A
83	C
84	A
85	D
86	D
87	A
88	B
89	C
90	A
91	A
92	C
93	A
94	B
95	B
96	A
97	A
98	A
99	C
100	B

MAHARASHTRA STATE ELIGIBILITY TEST - 7th April 2024
FINAL ANSWER KEY FOR PAPER -II (Booklet Code :B)
SUBJECT CODE & NAME: (37) Computer Science & Application

QueNo	Answer
1	A
2	A
3	A
4	A
5	D
6	9
7	D
8	A
9	B
10	D
11	B
12	C
13	A
14	C
15	B
16	A
17	C
18	C
19	A
20	C
21	A
22	A
23	B
24	D
25	C
26	D
27	C
28	9
29	D
30	B
31	D
32	A
33	C
34	A
35	D
36	D
37	C
38	A
39	A
40	D

QueNo	Answer
41	C
42	B
43	B
44	A
45	A
46	D
47	C
48	C
49	C
50	C
51	A
52	A
53	C
54	C
55	C
56	B
57	a
58	B
59	D
60	D
61	D
62	A
63	C
64	A
65	D
66	D
67	A
68	B
69	C
70	A
71	A
72	C
73	A
74	B
75	B
76	A
77	A
78	A
79	C
80	B

QueNo	Answer
81	A
82	A
83	A
84	A
85	A
86	A
87	A
88	9
89	A
90	A
91	D
92	B
93	C
94	A
95	B
96	C
97	B
98	D
99	B
100	D

MAHARASHTRA STATE ELIGIBILITY TEST - 7th April 2024
FINAL ANSWER KEY FOR PAPER -II (Booklet Code :C)
SUBJECT CODE & NAME: (37) Computer Science & Application

QueNo	Answer
1	A
2	A
3	B
4	D
5	C
6	D
7	C
8	9
9	D
10	B
11	D
12	A
13	C
14	A
15	D
16	D
17	C
18	A
19	A
20	D
21	C
22	B
23	B
24	A
25	A
26	D
27	C
28	C
29	C
30	C
31	A
32	A
33	C
34	C
35	C
36	B
37	a
38	B
39	D
40	D

QueNo	Answer
41	D
42	A
43	C
44	A
45	D
46	D
47	A
48	B
49	C
50	A
51	A
52	C
53	A
54	B
55	B
56	A
57	A
58	A
59	C
60	B
61	A
62	A
63	A
64	A
65	A
66	A
67	A
68	9
69	A
70	A
71	D
72	B
73	C
74	A
75	B
76	C
77	B
78	D
79	B
80	D

QueNo	Answer
81	A
82	A
83	A
84	A
85	D
86	9
87	D
88	A
89	B
90	D
91	B
92	C
93	A
94	C
95	B
96	A
97	C
98	C
99	A
100	C

MAHARASHTRA STATE ELIGIBILITY TEST - 7th April 2024
FINAL ANSWER KEY FOR PAPER -II (Booklet Code :D)
SUBJECT CODE & NAME: (37) Computer Science & Application

QueNo	Answer
1	C
2	B
3	B
4	A
5	A
6	D
7	C
8	C
9	C
10	C
11	A
12	A
13	C
14	C
15	C
16	B
17	a
18	B
19	D
20	D
21	D
22	A
23	C
24	A
25	D
26	D
27	A
28	B
29	C
30	A
31	A
32	C
33	A
34	B
35	B
36	A
37	A
38	A
39	C
40	B

QueNo	Answer
41	A
42	A
43	A
44	A
45	A
46	A
47	A
48	9
49	A
50	A
51	D
52	B
53	C
54	A
55	B
56	C
57	B
58	D
59	B
60	D
61	A
62	A
63	A
64	A
65	D
66	9
67	D
68	A
69	B
70	D
71	B
72	C
73	A
74	C
75	B
76	A
77	C
78	C
79	A
80	C

QueNo	Answer
81	A
82	A
83	B
84	D
85	C
86	D
87	C
88	9
89	D
90	B
91	D
92	A
93	C
94	A
95	D
96	D
97	C
98	A
99	A
100	D