

Tribhuvan University
Institute of Science and Technology
4 Years Bachelor in Computer Science and Information Technology
Entrance Examination
Model set 4

Physics

1. A train 110m length travel at 60 km/hr. The time in which a man walking at 6km/hr in opposite direction pass the train is
a. 6.6 sec b. 66 sec c. 6 sec d. 5.4 sec
2. The maximum velocity of a car in level road of radius 80m in which car move without skidding if coefficient of friction is 0.25 is
a. 10m/s b. 8m/s c. 12m/s d. 14m/s
3. A fly wheel of mass 25 kg has a radius of 0.2m. It is making 240 rpm. The torque required to stop in rest in 20 sec is
a. 314Nm b. 0.628Nm c. 0.314Nm d. 1.26Nm
4. A cube is subjected to a pressure of $5 \times 10^5 \text{ N/m}^2$. Each side of the cube is shortened by 1% the bulk modulus of cube
a. $8.3 \times 10^6 \text{ N/m}^2$ b. $1.67 \times 10^7 \text{ N/m}^2$ c. $3.32 \times 10^7 \text{ N/m}^2$ d. $6.4 \times 10^7 \text{ N/m}^2$
5. A spherical liquid drop of radius R is divided into 8 equal droplets. Its surface tension is T then work done in the process will be
a. $2\pi R^2 T$ b. $3\pi R^2 T$ c. $4\pi R^2 T$ d. $2\pi R T^2$
6. An oxygen cylinder of volume 30 litres has an initial pressure 15 atmosphere and a temperature of 27°C . Some gas is withdrawn from the cylinder and pressure drops to 11 atmosphere at 17°C . The mass of gas withdrawn is
a. 453.1g b. 584.1g c. 141g d. 282g
7. An ideal heat engine operates in Carnot cycle between 227°C and 127°C . It absorbs 10^4 Joule of heat from a higher temperature. The amount of heat converted into work is
a. 2000J b. 4000J c. 8000J d. 5600J
8. Air column in resonance air column experiment of 100cm & 101 cm give 17 beats in 20 sec. The velocity of sound is
a. 320m/s b. 332m/s c. 343m/s d. 360m/s
9. Two wires of same material are stretched with the same force their diameters are 1.2mm & 1.6mm respectively. The frequency of first is 256 then frequency of 2^{nd} is

a.244Hz b.288Hz c.312Hz d.344Hz

10. Two charges of $15\mu\text{C}$ & $9\mu\text{C}$ are at 18cm apart. The work done to bring them 3cm closer is

a.0.625J b.1.35J c.2.7J d.4.05J

11. An air filled parallel plate capacitor of capacitance $12\mu\text{C}$ is charged by 1200V. The minimum area of capacitor for dielectric strength $3 \times 10^9 \text{V/m}$ is

a. 0.54m^2 b. 0.9m^2 c. 1.35m^2 d. 1.8m^2

12. A parallel combination of three resistors take a current of 7.5A from a 30V. The two resistors of 10Ω & 12Ω then 3rd resistor is

a. 14Ω b. 15Ω c. 20Ω d. 30Ω

13. The self-inductance of air core solenoid increases from 0.04mH to 16mH on introducing an iron core into it. The relative permeability of the core is

a.150 b.200 c.400 d.800

14. In an acc circuit the current is

$I = 5\sin(100t - \pi/2)\text{A}$ and potential is $V = 200\sin(100t)\text{volt}$ then power consumed is

a.20W b.40W c.100W d.0

15. A needle placed 45cm from a lens forms an image on a screen placed 90cm on the other side of lens. The size of image of object 5cm is

a.5cm b.10cm c.15cm d.20cm

16. In Young's double slit experiment two coherent sources are placed at 0.9mm apart and the fringes are observed one metre away. The second dark fringe is produced 1mm from the central fringe. The wavelength of light used is

a. $60 \times 10^{-4}\text{m}$ b. $10 \times 10^{-4}\text{cm}$ c. $10 \times 10^{-5}\text{cm}$ d. $6 \times 10^{-5}\text{cm}$

17. The wavelength of electron wave of energy 50eV is

a. 1.73\AA b. 3.46\AA c. 5.19\AA d. 6.92\AA

18. A piece of metal is illuminated by monochromatic light of wavelength λ then stopping potential for photo electric current is $2.5V_0$. When same surface is illuminated by light of wavelength 1.5λ then stopping potential V_0 . The threshold wavelength is

a. 1.5λ b. 2λ c. 2.25λ d. 4λ

19. The frequency of electron is 2nd Bohr's orbit of radius 2.12\AA is

a. $8.2 \times 10^{13}\text{Hz}$ b. $8.2 \times 10^{14}\text{Hz}$ c. $8.2 \times 10^{15}\text{Hz}$ d. $8.2 \times 10^{16}\text{Hz}$

20. Half -life of two radioactive substances A & B are 20 minutes & 40 minutes respectively. The same of equal numbers of atoms initially are taken then ratio of no of atoms left after 80 minutes is

a.1:16 b.4:1 c.1:4 d.1:1

21. If K.E. of a body become twice its initial value, then new momentum of the body will be

a. 2 times b. $\sqrt{2}$ times c. 4 times d. unchanged

22. When water is heated from 0°C to 10°C , its volume

a. increases b. decreases c. doesn't change d. 1st decreases then increases

23. Acceleration at highest point when a ball is projected is

a. zero b. upwards c. downwards d. none

24. Coefficient of thermal conductivity of metal depends on

a. Temperature difference b. Thickness of metal c. Area of plate d. None of the above

25. If the number of turn in a coil is doubled then its self-inductance will become

a. double b. halved c. four times d. unchanged

Chemistry

26. The number of electrons present in 3.2 grams of CH_4 is

a. $0.25 N_a$ b. $0.5 N_a$ c. $0.75 N_a$ d. N_a

27. The vapour density of a metal chloride is 99 and the equivalent weight of metal is 63.5 . The formula of metal chloride is

a. MCl b. M_2Cl_2 c. MCl_2 d. M_2Cl_4

28. The mole fraction of NaOH in 0.4m NaOH solution is

a. 7.5×10^{-3} b. 3.25×10^{-3} c. 7.15×10^{-4} d. 3.25×10^{-4}

29. How many unpaired electrons are present in Fe^{3+} ion

a.3 b.5 c.1 d.6

30. Among LiCl , BeCl_2 , BCl_3 and CCl_4 the covalent character follow the order

a. $\text{LiCl} > \text{BeCl}_2 > \text{BCl}_3 > \text{CCl}_4$

b. $\text{LiCl} < \text{BeCl}_2 < \text{BCl}_3 < \text{CCl}_4$

c. $\text{LiCl} > \text{BeCl}_2 > \text{CCl}_4 > \text{BCl}_3$

d. $\text{LiCl} < \text{BeCl}_2 < \text{CCl}_4 < \text{BCl}_3$

31. The ammonia is dried over

- a. the slaked lime b. quick lime c. calcium chloride d. phosphorous pentachloride
32. Vertical retort is used in the extraction of zinc due to its
- a. low boiling point b. high boiling point c. low melting point d. high melting point
33. The equivalent weight of $K_2Cr_2O_7$ in acidic medium is
- a. $M/6$ b. $M/3$ c. M d. $M/5$
34. H_3O^+ is acid according to the theories
- a. Arrhenius+ Bronsted Lowery
- b. Arrhenius + Lewis
- c. Arrhenius+ Lewis
- d. Arrhenius+Bronsted Lowery+Lewis
35. Kerosene oil is the mixture of
- a. aromatic compounds b. aliphatic acids c. alkanes d. alcohols
36. A gas decolourises alkaline $KMnO_4$ solution but does not give precipitate with ammonical $AgNO_3$ solution is
- a. ethane b. ethylene c. methane d. ethyne
37. An element has the general configuration $(n-1)d^3ns^2$. The element is placed in the group
- a.IIA b.IIB c.VA d. VB
38. Galena is an ore of
- a. Pb b. Zn c. Hg d. Fe
39. During extraction of copper from Copper pyrites the slag
- a. $CaSiO_3$ b. $FeSiO_3$ c. $Mg(PO_4)_2$ d. $MgSiO_3$
40. Which of the following has highest ionic character
- a. $MgCl_2$ b. $CaCl_2$ c. $BeCl$ d. $NaCl$
41. Bleaching action of Cl_2 in presence of moisture is
- a. oxidation b. reduction c. hydrolysis d. substitution
42. Bessemer converter is used in the manufacture of
- a. cast iron b. pig iron c. silver d. steel
43. Which of the following is used to remove temporary hardness of water
- a. slaked lime b. plaster of paris c. Epsom d. hydrolith
44. Producer gas is

a. $\text{CO} + \text{N}_2$ b. $\text{C} + \text{N}_2$ c. $\text{CO}_2 + \text{H}_2$ d. $\text{CO} + \text{H}_2\text{O}$

45. Willimite is the ore of

a. Al b. Cu c. Zn d. Ca

46. The impurities associated with minerals are collected

a. flux b. gangue c. slag d. ore

47. Which of the following is used in welding

a. CH_4 b. C_2H_4 c. C_2H_2 d. C_2H_6

48. The possible number of isomers of C_6H_{14} is

a. 2 b. 3 c. 4 d. 5

49. The IUPAC name of t-butyl alcohol is

a. Butanol-1 b. Butanol-2 c. 2-methyl propanol-1 d. 2-methyl propanol-2

50. The solubility of AgCl is minimum in

- a. pure water
- b. 0.0001 M AgNO_3
- c. 0.1 N NaCl
- d. 11.1 gm L^{-1} CaCl_2 sol

English

51. The word 'interest' has its primary stress on the Syllable

a. 1st b. 2nd c. 3rd d. none

52. The synonym of 'abase' is

a. humiliate b. abate c. abortive d. profound

53. The antonym of 'scrupulous' is

a. disscrupulous b. descrupulous c. unscrupulous d. inscrupulous

54. Which of the following is acceptable?

- a. He said that they had been working
- b. He told that they had been working
- c. he said me that they had been working
- d. none

55. John is addicted to

- a. drink b. drunk c. drinks d. drinking

56. The police come in time

- a. has b. are c. have been d. is to

57. The flag was hauled.....sunset

- a. in b. at c. to d. into

58. The passive voice of "Listen to me" is

- a. I should have listened to
- b. Let me be listened to
- c. I am listened to
- d. None

59. Tick on compound sentence

- a. If you do not waste, you will not want
- b. Waste not, want not
- c. Waste not but want not
- d. All of these

60. Which of the following is the correct grammatical pattern for the sentences – "Tell him where to put it"

- a. V+O+Interrogative phrase
- b. V+O+Interrogative phrase +to-infinitive
- c. S+Noun/Pronoun+Interrogative phrase+to-infinitive
- d. S+Noun/Pronoun+to-infinitive phrase

61. I had sooner

- a. run than walk
- b. running than walking
- c. run than walking
- d. all of these

62. The drowning passengers were brought..... ashore

- a. about b. off c. on d. up

63. I took my friend a thief

- a. at b. for c. with d. up

64. The word "religious" has.....

- a. three vowels and four consonants
- b. five vowels and four consonants
- c. four vowels and four consonants
- d. four vowels and five consonants

65. The boy made someremarks

- a. uncautious b. imcaustious c. incautious d. encautious

66. In the sentence "Opera reached its zenith at the turn of the century ", the word "zenith" can be replaced by.....for its opposite meaning

- a. nadir b. climax c. apex d. crisis

67. Which of the following sentences is correctly used

- a. Heat the water until it boils away
- b. Heat the water until it has boiled away
- c. Heat the water until it is boiling away
- d. Heat the water until it will boil away

68. There are several boys and girls in the class and everyone has finishedwork. The blank in this sentence cannot be filled out why

- a. his b. their c. his/her d. her

69. The sentence pattern "subject+transitive verb+direct object:that clauses" agrees with this sentence:

- a. He thinks that his friend has written a letter
- b. He told his parents that he had passed the exam
- c. I know what he has done
- d. The policeman warned him that the road was dangerous

70. Pick out the sentence which is not acceptable

- a. He worked over summer
- b. He worked for summer
- c. He worked during summer
- d. He worked on summer

71. The indirect form of the dialogue below can be any one of the following except.....He said to me, "will you pass the salt, I agreed"

- a. He asked me if I would pass the salt and I said I would
- b. When he asked me to pass the salt, I agreed
- c. He requested me to pass the salt and I accepted
- d. He told me to pass the salt and I replied in the affirmative

72. One of the following sentences gives the meaning I doubt if he is honest

- a. He is honest
- b. He is honest?
- c. Is he honest?
- d. He is honest?

73. Which of the following sentence does not contain an affirmative:

- a. he helped me do this
- b. do this
- c. I will do this
- d. I made him do this

74. My friend went to Delhi, which is the capital of India. This is a sentence

- a. compound
- b. complex
- c. simple
- d. compound complex

75. "He looks heavy eyed" means

- a. he looks angry
- b. his eyes are red
- c. he has a fever
- d. he is frightened

Math

76. The solution of $\tan^{-1}2x + \tan^{-1}3x = \pi/4$ is

a. $1/2$ b. $1/4$ c. $1/5$ d. $1/6$

77. If $A=\{1,2,3,4,5\}$ then the number of proper subsets of A are

a. 32 b. 31 c. 30 d. 16

78. A,B,C are three sets such $(A \cup B) = (A \cup C)$ & $(A \cap B) = (A \cap C)$ then

a. $A=B$ b. $B=C$ c. $A=C$ d. $A=B=C$

79. $a.(b+c)$ is equal to

a. $a.b+a.c$ b. $a+b.c$ c. $a.b+c$ d. $a.b+abc$

80. $\int_0^2 \frac{dx}{(1+5x)} =$

a. $1/5 \log 2$ b. $1/5 \log 3$ c. $1/11 \log 7$ d. $1/5 \log 11$

81. If a,b,c are in A.P. as well as in G.P. then

a. $a=b=c$ b. $a \neq b \neq c$ c. $a \neq b=c$ d. $a=-b=2c$

82. The equation $ax^2+2hxy+by^2+2gx+2fy+c=0$ represents a circle if

a. $a=b$ b. $h=0$ c. $a=b, h=0$ d. $c=0, h=0, a=b$

83. If (2,0) is the vertex & y-axis is the directrix of a parabola, then its focus is

a. (-2,0) b. (4,0) c. (-4,0) d. (0,-4)

84. Is $\sin^2 \theta = 3/4$ then the general values of θ is

a. $n\pi \pm \pi/3$ b. $n\pi + \pi/3$ c. $2n\pi \pm \pi/3$ d. $n\pi + (-1)^n \pi/3$

85. If $\frac{\sin A}{\sin C} = \frac{\sin(A-B)}{\sin(B-C)}$ then a^2, b^2, c^2 are in

a. A.P. b. G.P. c. H.P. d. None

86. The radius of the circle passing through the foci of an ellipse $\frac{x^2}{16} + \frac{y^2}{9} = 1$ & having its centre (0,3) is

a. $1/2$ b. 7 c. 5 d. 4

87. The area between the parabola $y=x^2$ & the line $y=x$ is

a. $1/3$ b. $1/2$ c. $1/6$ d. none

88. $(\sin x + \cos x)dx = \int_{-\pi/2}^{\pi/2}$

a. 2 b. $\sqrt{2}$ c. 0 d. -2

89. The ratio of the roots of the equation $ax^2+bx+c=0$ are in the ratio 3:4 are

- a. $12b^2=49ac$ b. $12a^2=49bc$ c. $7a^2=144bc$ d. none
90. The value of $(1-2\omega+\omega^2)^6$ is
a. 128 b. 64
91. The number of 4 digits number that can be formed from the integers 2.3.4.5.6 are
a. 60 ways b. 120 ways c. 240 ways d. 128 ways
92. if $|a+b|=|a-b|$ then
a. a is parallel to b
b. $a=3b$
c. $a=2b$
d. a is perpendicular to b
93. The locus of the equation $x^2-5x+6=0$ is
a. empty set
b. a set containing two distinct points
c. a pair of parallel lines
d. none
94. Which of the following is not true?
a. $(A-B)^1=B^1-A^1$ b. $(BA)^1=A^1B^1$ c. $(A+B)^1=A^1+B^1$ d. $(AB)^{-1}=B^{-1}A^{-1}$
95. The greatest coefficient in the expansion of $(1+x)^{12}$ is
a. $C(12,7)$ b. $C(13,8)$ c. $^{12}C_8$ d. $C(12,6)$
96. If $(b+c+a)(b+c-a)=3bc$ then A is
a. 30° b. 60° c. 45° d. 120°
97. If G be the centroid of a triangle ABC & O is any point then $OA+OB+OC$ is equal to
a. OG b. 2OG c. 3OG d. none
98. The system of linear equations $x+7y=9$ & $3x-2y=1$ are
a. dependent & consistent
b. independent & inconsistent
c. independent & consistent
d. dependent & inconsistent
99. If a set $N=\{ax:x\in N\}$ then $(3N\cap 7N)$ is

a. {3,6,9,12,.....} b. {21,42,63,.....} c. {7,14,21,.....} d.none

100. if $x+y+z=xyz$ then $\tan^{-1}x+\tan^{-1}y+\tan^{-1}z=$

a. π b. $-\pi$ c. $\pi/2$ d. 2π

Phyics answers

1.c	2.d	3.b	4.b	5.c
6.c	7.a	8.c	9.b	10.b
11.d	12.b	13.c	14.d	15.b
16.d	17.a	18.c	19.b	20.c
21.c	22.a	23.c	24.d	25. c

Chemistry answers

26.d	27.b	28.a	29.b	30.b
31.b	32.a	33.a	34.b	35.d
36.c	37.b	38.d	39.a	40.b
41.a	42.d	43.a	44.a	45.c
46.b	47.c	48.d	49.d	50.d

English answers

51.a	52.a	53.a	54.c	55.a
56.d	57.c	58.a	59.b	60.a
61.b	62.c	63.a	64.a	65.c
66.a	67.b	68.d	69.a	70.d
71.d	72.d	73.b	74.a	75.a

Math answers

76.a	77.b	78.b	79.a	80.d
81.a	82.c	83.b	84.a	85.a
86.d	87.c	88.a	89.a	90.c
91.b	92.d	93.c	94.a	95.d
96.b	97.b	98.c	99.b	100.a