K

COMMON FIRST REVISION EXAMINATION - JANUARY - 2020

X STANDARD

Reg. No. | | | | | | | |

Time: 3.00 Hours **Science** **Marks:75**

Instructions: (1) Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately
(2) Use Blue or Black ink to write and pencil or draw diagrams.

Part - I

Note: (i) Answer all questions. 12×1=12
(ii) Choose the correct answer from the four alternatives and write the option code and the corresponding answer.

1) Impulse is equals to
   a) rate of change of momentum b) rate of force and time
   c) change of momentum d) rate of change of mass

2) The eye defect 'presbyopia' can be corrected by
   a) Convex lens b) Concave lens
   c) Convex mirror d) Bifocal lenses

3) The sound waves are reflected from an obstacle into the same medium from which they were incident. Which of the following changes?
   a) Speed b) Frequency
   c) Wavelength d) None of these

4) In the nuclear reaction ${}_{6}X^{12} \xrightarrow{\text{decay}} {}_{Z}Y^{A}$ the value of A and Z.
   a) 8, 6 b) 8, 4
   c) 4, 8 d) cannot be determined with the given data

5) _____ is an important metal to form amalgam.
   a) Ag b) Hg
   c) Mg d) Aℓ

6) Deliquencence is due to _____
   a) strong affinity to water b) less affinity to water
   c) strong hatred to water d) Inertness to water

7) Which of the following is not an "element + element → compound" type reaction?
   a) $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)}$ b) $2K_{(s)} + Br_{2(l)} \rightarrow 2KBr_{(s)}$
   c) $2CO_{(g)} + O_{2(g)} \rightarrow 2CO_{2(g)}$ d) $4Fe_{(s)} + 3O_{2(g)} \rightarrow 2Fe_2O_{3(s)}$

19) Which hormone is known as 'time messenger'? Why?
20) Write the characteristic of insect pollinated flowers.
21) What is shale gas?
22) Three resistors of resistances 5 ohm, 3 ohm and 2 ohm are connected in series with 10V battery. Calculate their effective resistance and the current flowing through the circuit.

Part - III

Note: Answer any seven Questions. Q.No. 32 is compulsory. 7×4=28

23) i) Define electric potential and potential difference.
ii) State ohm's law.
24) i) What do you understand by the term 'ultrasonic' vibration?
ii) State three uses of ultrasonic vibrations.
25) i) Give an example each i) gas in liquid
ii) solid in liquid
iii) Solid in solid
iv) gas in gas
ii) A hot saturated solution of copper sulphate forms crystals as it cools. Why?
26) i) What is the pH value of human saliva and milk of Magnesia?
ii) The hydroxide ion concentration of a solution is 1×10^{-11} M. What is the pH of the solution?
27) i) Explain the excretory system of leech.
ii) List out the parasitic adaptations in leech.
28) Illustrate the structure and functions of brain.
29) i) What do you understand by the term phenotype and genotype?
ii) What are allosomes?
30) i) How can you determine the age of the fossile?
ii) What are the types of variations?
31) Discuss the importance of biotecnology in the field of medicine.
32) The molecular formula of an alcohol is $C_4H_{10}O$. The locant number of its –OH group is 2.
i) Draw the structural formula.

ii) Give its IUPAC name.

iii) Is it saturated or unsaturated?

Part - IV

Note: Answer all the Questions 3×7=21

Draw diagram wherever necessary.

33) a) i) Give the applications of universal law of gravitation.

ii) A door is pushed, at a point whose distance from the hinger is 90 cm, with a force of 40N. Calculate the moment of the force about the hinges.

(or)

b) i) Explain the process of controlled and uncontrolled chain reaction.

ii) Compare the properties of alpha, beta and gamma radiations (any 4 properties)

34) a) i) Explain froth floatation process.

ii) Metal A belongs to period 3 and group 13. A in red hot condition reacts with steam to form B. A with strong alkali forms C. Find A, B and C with reactions.

(or)

b) i) Differentiate soaps and detergents.

ii) What is called homologous series? Give any three of its characteristics?

35) a) i) What is transpiration? Give the importance of transpiration.

ii) Differentiate Artery and Vein. (any 3)

(or)

b) i) Suggest measures to overcome the problems of an alcoholic.

ii) Explain the types of cancers.

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8) The IUPAC name of CH3CH2CHO is _____.
   a) propanol b) propanal
   c) propanone d) propanoic ac
9) Oxygen is produced at what point during photosynthesis?
   a) when ATP is converted to ADP b) When CO_2 is fixed
   c) when H_2O is splitted d) All of these
10) The brain of leech lies above the
   a) Mouth b) Buccal cavity
   c) Pharynx d) Crop
11) International Day against Drug Abuse and Illicit Trafficking is
   a) June 26 b) July 26
   c) June 25 d) May 25
12) All files are stored in the _____.
   a) Folder b) Box
   c) Pai d) Scanner

Part - II

Note: Answer any seven Questions. Q.No. 22 is compulsory. **7×2=14**

13) Differentiate mass and weight.
14) Define one calorie.
15) Fill in the blanks:-
   i) $_{92}U^{235} + {}_0n^1 \rightarrow$ _____ $+ {}_{36}Kr^{92} + 3{}_0n^1 + Q$ (energy)
   ii) The radio isotope of _____ helps to increase the productivity of crops.
16) A is silvery white metal. A combines with O_2 to form B at 800°C, the alloy of A is used in making the aircraft. Find A and B.
17) What are the factors affecting photosynthesis.
18) **Match the following**

1. Leukemia	- Inflammation
2. Leucopenia	- Absence of antibody
3. AB blood group	- Blood cancer
4. Neutrophils	- Decrease in leucocytes

23. A man goes 18m due east and then 24m due north. Find the distance of his current position from the starting point?
24. Find the equation of a line passing through the point (3, –4) and having slope –5/7.
25. Prove that $\frac{\sec\theta}{\sin\theta} - \frac{\sin\theta}{\cos\theta} = \cot\theta$.
26. The radius and height of a cylinder are in the radio 5:7 and its curved surface area is 5500sq.cm. Find its radius and height.
27. Two coins are tossed together. What is the probability of getting different faces on the coins?
28. When a positive integer is divided by 5.
    1) What are the possible remainders?
    2) In which form can it be written?

PART - III (Marks-50)

Note: Answer any 10 questions. Question No.42 is compulsory. ***(10×5=50)***

29. If the function f is defined by
$$f(x)=\begin{cases} x+2 \text{ if } x>1 \\ 2 \text{ if } -1\le x\le 1 \\ x-1 \text{ if } -3<x<-1 \end{cases}$$
find the value of i) f(3) ii) f(0) iii) f(2)+f(–2)
30. If f(x)=2x+3, g(x)=1–2x and h(x)=3x. Prove that fo(goh)=(fog)oh.
31. Find the sum of all natural numbers between 300 and 600 which are divisible by 7.
32. Find the sum of the series $(2^3-1^3)+(4^3-3^3)+(6^3-5^3)+\ldots$ to n terms.
33. If $A=\begin{pmatrix} 1 & 2 & 1 \\ 2 & -1 & 1 \end{pmatrix}$ and $B=\begin{pmatrix} 2 & -1 \\ -1 & 4 \\ 0 & 2 \end{pmatrix}$ show that $(AB)^T=B^TA^T$.
34. Solve : $pqx^2-(p+q)^2x+(p+q)^2=0$.
35. State and prove Angle Bisector Theorem.
36. Find the area of quadrilateral whose vertices are (–9, 0), (–8, 6), (–1, –2) and (–6, –3).
37. From a window (h metres heigh above the ground) of a house in a street, the angles of elevation and depression of the top and the foot of another house on the opposite side of the street are θ_1 and θ_2 respectively. Show that the height of the opposite house is $h\left(1+\frac{\cot\theta_2}{\cot\theta_1}\right)$.
38. If the radii of the circular ends of Frustum which is 45cm high are 28cm and 7cm, find the volume of the frustum.
39. An aluminium sphere of radius 12cm is melted to make a cylinder of radius 8cm. Find the height of the cylinder.
40. Find the co-efficient of variation of 24, 26, 33, 37, 29, 31
41. A card is drawn a pack of 52 cards. Find the probability of getting a king or a heart or a red card.
42. The area of the square is given by $x^4-8x^3+24x^2-32x+16$. Find the side of the square.

PART - IV (Marks-16)

Note: Answer both questions. ***(2×8=16)***

43. a) Take a point which is 11cm away from the centre of a circle of radius 4cm and draw the two tangents to the circle from that point. ***(OR)***
    b) Draw a triangle ABC of base BC=8cm, ∠A=60° and the bisector of ∠A meets BC at D such that BD=6cm.
44. a) Draw the graph of $x^2+x+7=0$ and discuss the nature of solutions of the quadratic equations. ***(OR)***
    b) A Mobile phone is put to use when the battery power is 100%. The percent of battery power 'y' (in decimal) remaining after using the mobile phone for x hours is assumed as y=–0.25x+1.
    1) Draw a graph of the equation.
    2) Find the number of hours elapsed if the battery power is 40%.
    3) How much time does it take so that the battery has no power?

FIRST REVISION TEST - 2020	Exam No.	15
Time: 3-00 Hrs.	X - MATHS	Marks : 100

PART - I (Marks-14)

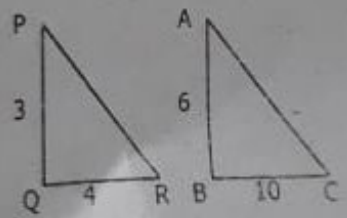
Note : *1) Answer all the questions.* *(14x1=14)*
2) Choose the best answer and write option code corresponding answer.

1. If there are 1024 relations from a set A={1, 2, 3, 4, 5} to a set B, then the number of elements in B is
   1) 3 2) 2 3) 4 4) 8
2. If $f(x)=\frac{x-1}{x+1}$, $x\neq -1$, $x\neq 0$ then f(f(x)) is
   1) $\frac{1}{x}$ 2) $\frac{1}{x+1}$ 3) $-\frac{1}{x}$ 4) x
3. Given $F_1=1$, $F_2=3$ and $F_n=F_{n-1}+F_{n-2}$ then F_5 is
   1) 3 2) 5 3) 8 4) 11
4. If (x–6) is the HCF of $x^2-2x-24$ and x^2-Kx-6 then the value of K is
   1) 3 2) 5 3) 6 4) 8
5. Graph of a linear polynomial is a
   1) straight line 2) circle 3) parabola 4) hyperbola
6. If ΔABC is an isosceles triangle with ∠C=90° and AC=5cm, then AB is
   1) 2.5cm 2) 5cm 3)10cm 4) $4\sqrt{2}$ cm
7. The equation of the line passing through the origin and perpendicular to the line 7x–3y+4=0 is
   1) 7x–3y+4=0 2) 3x–7y+4=0 3) 3x+7y=0 4) 7x–3y=0
8. If sinθ+cosθ=a and secθ+cosecθ=b then the value of b(a²–1) is equal to
   1) 2a 2) 3a 3) 0 4) 2ab
9. If the ratio of the height of a tower and the length of its shadow is $\sqrt{3}$:1, then the angle of elevation of the sun has measure
   1) 45° 2) 30° 3) 90° 4) 60°
10. The total surface area of a hemi-sphere is how much times the square of its radius
    1) π 2) 4π 3) 3π 4) 2π
11. Which of the following is incorrect?
    1) P(A)>1 2) 0≤P(A)≤1 3) P(ϕ)=0 4) P(A)+P($\bar{A}$)=1
12. If the sum of 10 data values is 265 then their mean is
    1) 2.65 2) 3 3) 26.5 4) 0
13. Let m divides n. Then GCD and LCM of m, n are
    1) 1, 0 2) m, n 3) n, m 4) mn, 1
14. If the order of a matrix is 2x3 then the order of its Transpose matrix is
    1) 2x3 2) 2x2 3) 3x3 4) 3x2

PART - II (Marks-20)

Note: Answer any 10 questions. Question No.28 is compulsory. *(10x2=20)*

15. If A={2, –2, 3} then find A x A.
16. Let f(x)=2x+5. If x≠0 then find $\frac{f(x+2)-f(2)}{2}$.
17. Show that the square of an odd integer is of the form 4q+1, for some integer q.
18. If 3+K, 18–K, 5K+1 are in A.P. then find K.
19. Find the LCM of x^4-1, x^2-2x+1.
20. The roots of the equation $2x^2-7x+5=0$ are α and β. Find the value of $\frac{1}{\alpha}+\frac{1}{\beta}$.
21. If $A=\begin{pmatrix}5 & 4 & 3\\ 1 & -7 & 9\\ 3 & 8 & 2\end{pmatrix}$ then find the transpose of A.
22. Is ΔABC ~ ΔPQR?



Given series: $(2^3-1)+(4^3-3^3)+(6^3-5^3)+\cdots$

$$S_n = \sum\left[(2^3-1^3)+(4^3-3^3)+(6^3-5^3)+\cdots\right]$$

$$= \sum\left[(2n)^3-(2n-1)^3\right]$$

$$= \sum\left[8n^3-(8n^3-12n^2+6n-1)\right]$$

$$\left[\because (a-b)^3 = a^3-3ab^2+3ab+b^3\right]$$

$$= \sum\left[8n^3-8n^3+12n^2-6n+1\right]$$

$$= \sum\left[12n^2-6n+1\right]$$

$$= 12\sum n^2 - 6\sum n + \sum 1 \qquad \left[\because \sum 1 = n\right]$$

$$= \frac{12}{6}\,\frac{n(n+1)(2n+1)}{} - \frac{6^3}{2}\,\frac{n(n+1)}{} + n$$

$$= 2n(2n^2+3n+1) - 3n(n+1) + n$$

$$= 4n^3+6n^2+2n-3n^2-3n+n$$

$$S_n = 4n^3+3n^2.$$

$$S_8 = 4(8)^3+3(8^2)$$

$$= 2048+192$$

$$= 2240$$

$$\begin{array}{r} 64 \\ 3 \\ \hline 192 \end{array} \qquad \begin{array}{r} 64 \\ 8 \\ \hline 512 \\ 4 \\ \hline 2048 \end{array}$$