

CENTRE FOR SOCIAL RESPONSIBILITY AND LEADERSHIP



SAMPLE PAPER – ENGINEERING **For class- XIth appearing students**

IMPORTANT INSTRUCTIONS

A. GENERAL INSTRUCTIONS

1. The Test is of **2 hours duration**.
2. The Test Paper contains 60 Questions. **The Maximum Marks are 240.**
3. The Test Paper consists of Four Parts - **Part I (Aptitude), Part II (Physics), Part III (Chemistry) and Part IV (Mathematics).**
4. Each Part consists of 15 Multiple Choice Type Questions with only one option correct.
5. +4 marks will be given for each correct answer and –1mark for each wrong answer in Multiple choice type questions.
6. There is only one correct response for each question. Filling up more than one response in each question will be treated as wrong response and marks for wrong response will be deducted accordingly as per given instructions.

B. RESTRICTIONS DURING THE TEST

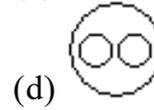
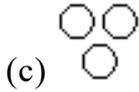
1. Calculators are not allowed in this test.
2. Use of mobile phones in the examination hall is strictly prohibited.
3. Log tables and electronic gadgets in any form are not allowed.
4. No additional sheets will be provided for rough work.

C. HELPFUL HINTS

1. Work quickly and accurately.
2. If you are not sure of an answer, mark your best choice and avoid wild guessing.

APTITUDE (PART-I)

1. Which of the following diagrams indicates the best relation between Factory, Product and Machinery?



2. A clock is started at noon. By 10 min past 5, the hour hand has turned through:

(a) 145°
(c) 155°

(b) 150°
(d) 160°

3. A two-digit number is such that the product of the digits is 8. When 18 is added to the number, then the digits are reversed. The number is:

(a) 18
(c) 42

(b) 24
(d) 81

4. A man is 24 years older than his son. In two years, his age will be twice the age of his son. The present age of his son is:

(a) 14 years
(c) 20 years

(b) 18 years
(d) 22 years

5. If $5^a = 3125$, then the value of $5^{(a-3)}$ is:

(a) 25
(c) 625

(b) 125
(d) 1625

6. A fruit seller had some apples. He sells 40% apples and still has 420 apples. Originally, he had:

(a) 588 apples
(c) 672 apples

(b) 600 apples
(d) 700 apples

7. The angle of elevation of a ladder leaning against a wall is 60° and the foot of the ladder is 4.6 m away from the wall. The length of the ladder is:

(a) 2.3 m
(c) 7.8 m

(b) 4.6 m
(d) 9.2 m

8. If all circles are round, and all squares are not round, which of the following statements is true?

(a) All squares are circles.
(c) No squares are circles.

(b) Some squares are circles.
(d) Some circles are squares.

9. What is the next number in the series 3, 6, 18, 72, ...?

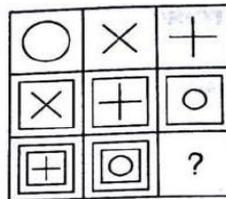
(a) 360
(c) 300

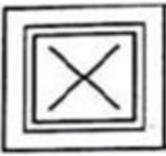
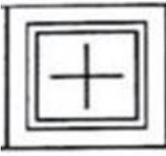
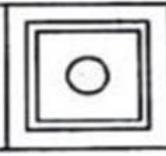
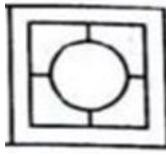
(b) 480
(d) 420

10. Pointing to a girl, Kirti Said, “She is the daughter of my brother’s wife”. How is the girl related to Kirti?
 (a) Nephew (b) Niece
 (c) Sister-in-law (d) Mother

11. In the following question, find out which of the answer figure (a), (b), (c) and (d) completes the figure matrix?

Problem figure:



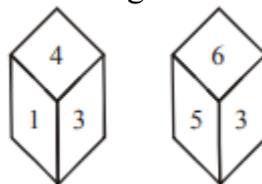
- (a)  (b)  (c)  (d) 

12. In each of the following question, find the number of triangles in the given figure.



- (a) 5 (b) 6
 (c) 8 (d) 10

13. The number of opposite side of the face having number 3 will be :



- (a) 1 (b) 2
 (c) 4 (d) 5

14. Y is in the East of X which is in the North of Z. If P is in the South of Z, then in which direction of Y, is P?

- (a) North (b) South
 (c) South-East (d) None of these

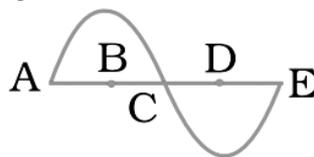
15. What should come in the place of question mark (?) in the following alpha-numeric series?

C-3, E-5, G-7, I-9, ?, ?

- (a) X-24, M-21 (b) K-11, M-13
 (c) O-15, X-24 (d) M-18, K-14

PHYSICS (PART-II)

16. Area under $v - t$ graph represents a physical quantity which has the unit
 (a) m^2 (b) m
 (c) m^3 (d) $m s^{-1}$
17. A passenger in a moving train tosses a coin which falls behind him. It means that motion of the train is
 (a) accelerated (b) uniform
 (c) retarded (d) along circular tracks
18. The gravitational force between two objects is F . If masses of both objects are halved without changing distance between them, then the gravitational force would become
 (a) $F/4$ (b) $F/2$
 (c) F (d) $2 F$
19. Which one of the following forms of energy leads to least environmental pollution in the process of its harnessing and utilisation?
 (a) Nuclear energy (b) Thermal energy
 (c) Solar energy (d) Geothermal energy
20. Fuel used in thermal power plants is
 (a) water (b) uranium
 (c) biomass (d) fossil fuels
21. Water stored in a dam possesses
 (a) no energy (b) electrical energy
 (c) kinetic energy (d) potential energy
22. Note is a sound
 (a) of mixture of several frequencies (b) of mixture of two frequencies only
 (c) of a single frequency (d) always unpleasant to listen
23. In the curve (Fig.) half the wavelength is



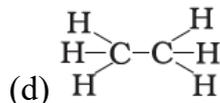
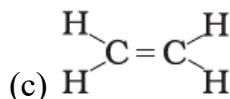
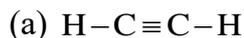
- (a) AB (b) BD
 (c) DE (d) AE
24. A 10 mm long awl pin is placed vertically in front of a concave mirror. A 5 mm long image of the awl pin is formed at 30 cm in front of the mirror. The focal length of this mirror is
 (a) -30 cm (b) -20 cm
 (c) -40 cm (d) -60 cm

25. Magnification produced by a rear view mirror fitted in vehicles
- (a) is less than one
 - (b) is more than one
 - (c) is equal to one
 - (d) can be more than or less than one depending upon the position of the object in front of it
26. A student sitting on the last bench can read the letters written on the blackboard but is not able to read the letters written in his text book. Which of the following statements is correct?
- (a) The near point of his eyes has receded away
 - (b) The near point of his eyes has come closer to him
 - (c) The far point of his eyes has come closer to him
 - (d) The far point of his eyes has receded away
27. To convert an AC generator into DC generator
- (a) split-ring type commutator must be used
 - (b) slip rings and brushes must be used
 - (c) a stronger magnetic field has to be used
 - (d) a rectangular wire loop has to be used
28. Electrical resistivity of a given metallic wire depends upon
- (a) its length
 - (b) its thickness
 - (c) its shape
 - (d) nature of the material
29. Which of the following represents voltage?
- (a) $\frac{\text{Work done}}{\text{Current} \times \text{Time}}$
 - (b) $\text{Work done} \times \text{Charge}$
 - (c) $\frac{\text{Work done} \times \text{Time}}{\text{Current}}$
 - (d) $\text{Work done} \times \text{Charge} \times \text{Time}$
30. For a current in a long straight solenoid N – and S – poles are created at the two ends. Among the following statements, the incorrect statement is
- (a) The field lines inside the solenoid are in the form of straight lines which indicates that the magnetic field is the same at all points inside the solenoid
 - (b) The strong magnetic field produced inside the solenoid can be used to magnetise a piece of magnetic material like soft iron, when placed inside the coil
 - (c) The pattern of the magnetic field associated with the solenoid is different from the pattern of the magnetic field around a bar magnet
 - (d) The N – and S – poles exchange position when the direction of current through the solenoid is reversed

CHEMISTRY (PART-III)

31. Arrange the following elements in the order of their decreasing metallic character
Na, Si, Cl, Mg, Al
(a) $\text{Cl} > \text{Si} > \text{Al} > \text{Mg} > \text{Na}$
(b) $\text{Na} > \text{Mg} > \text{Al} > \text{Si} > \text{Cl}$
(c) $\text{Na} > \text{Al} > \text{Mg} > \text{Cl} > \text{Si}$
(d) $\text{Al} > \text{Na} > \text{Si} > \text{Ca} > \text{Mg}$
32. The boiling points of diethyl ether, acetone and n-butyl alcohol are 35°C , 56°C and 118°C respectively. Which one of the following correctly represents their boiling points in kelvin scale?
(a) 306 K, 329 K, 391 K
(b) 308 K, 329 K, 392 K
(c) 308 K, 329 K, 391 K
(d) 329 K, 392 K, 308 K
33. Which of the following are homogeneous in nature?
(i) ice
(ii) wood
(iii) soil
(iv) air
(a) (i) and (iii)
(b) (ii) and (iv)
(c) (i) and (iv)
(d) (iii) and (iv)
34. Which of the following are chemical changes?
(i) Decaying of wood
(ii) Burning of wood
(iii) Sawing of wood
(iv) Hammering of a nail into a piece of wood
(a) (i) and (ii)
(b) (ii) and (iii)
(c) (iii) and (iv)
(d) (i) and (iv)
35. Which of the given elements A, B, C, D and E with atomic number 2, 3, 7, 10 and 30 respectively belong to the same period?
(a) A, B, C
(b) B, C, D
(c) A, D, E
(d) B, D, E
36. Which of the following has maximum number of atoms?
(a) 18g of H_2O
(b) 18g of O_2
(c) 18g of CO_2
(d) 18g of CH_4
37. The ion of an element has 3 positive charges. Mass number of the atom is 27 and the number of neutrons is 14. What is the number of electrons in the ion?
(a) 13
(b) 10
(c) 14
(d) 16
38. The electron distribution in an aluminium atom is
(a) 2, 8, 3
(b) 2, 8, 2
(c) 8, 2, 3
(d) 2, 3, 8

39. Structural formula of ethyne is



40. Which of the following are combination reactions?



(a) (i) and (iii)

(b) (iii) and (iv)

(c) (ii) and (iv)

(d) (ii) and (iii)

41. If a few drops of a concentrated acid accidentally spills over the hand of a student, what should be done?

(a) Wash the hand with saline solution

(b) Wash the hand immediately with plenty of water and apply a paste of sodium hydrogen carbonate

(c) After washing with plenty of water apply solution of sodium hydroxide on the hand

(d) Neutralise the acid with a strong alkali

42. In which of the following compounds, —OH is the functional group?

(a) Butanone

(b) Butanol

(c) Butanoic acid

(d) Butanal

43. Which of the following property is generally not shown by metals?

(a) Electrical conduction

(b) Sonorous in nature

(c) Dullness

(d) Ductility

44. Which of the following metals exist in their native state in nature?

(i) Cu

(ii) Au

(iii) Zn

(iv) Ag

(a) (i) and (ii)

(b) (ii) and (iii)

(c) (ii) and (iv)

(d) (iii) and (iv)

45. A molecule of ammonia (NH_3) has

(a) only single bonds

(b) only double bonds

(c) only triple bonds

(d) two double bonds and one single bond

MATHEMATICS (PART-IV)

46. $2\sqrt{3} + \sqrt{3}$ is equal to
(a) $2\sqrt{6}$ (b) 6
(c) $3\sqrt{3}$ (d) $4\sqrt{6}$
47. A cylindrical pencil sharpened at one edge is the combination of
(a) a cone and a cylinder (b) frustum of a cone and a cylinder
(c) a hemisphere and a cylinder (d) two cylinders.
48. Points $(1, -1)$, $(2, -2)$, $(4, -5)$, $(-3, -4)$
(a) lie in II quadrant (b) lie in III quadrant
(c) lie in IV quadrant (d) do not lie in the same quadrant
49. If a linear equation has solutions $(-2, 2)$, $(0, 0)$ and $(2, -2)$, then it is of the form
(a) $y - x = 0$ (b) $x + y = 0$
(c) $-2x + y = 0$ (d) $-x + 2y = 0$
50. Angles of a triangle are in the ratio $2 : 4 : 3$. The smallest angle of the triangle is
(a) 60° (b) 40°
(c) 80° (d) 20°
51. Two sides of a triangle are of lengths 5 cm and 1.5 cm. The length of the third side of the triangle cannot be
(a) 3.6 cm (b) 4.1 cm
(c) 3.8 cm (d) 3.4 cm
52. It is proposed to build a single circular park equal in area to the sum of areas of two circular parks of diameters 16 m and 12 m in a locality. The radius of the new park would be
(a) 10 m (b) 15 m
(c) 20 m (d) 24 m
53. The total surface area of a cube is 96 cm^2 . The volume of the cube is:
(a) 8 cm^3 (b) 512 cm^3
(c) 64 cm^3 (d) 27 cm^3
54. For some integer m , every even integer is of the form
(a) m (b) $m + 1$
(c) $2m$ (d) $2m + 1$

55. If $\sin A = \frac{1}{2}$, then the value of $\cot A$ is

(a) $\sqrt{3}$

(b) $\frac{1}{\sqrt{3}}$

(c) $\frac{\sqrt{3}}{2}$

(d) 1

56. If the lines given by $3x + 2ky = 2$ and $2x + 5y + 1 = 0$ are parallel, then the value of k is

(a) $\frac{-5}{4}$

(b) $\frac{2}{5}$

(c) $\frac{15}{4}$

(d) $\frac{3}{2}$

57. Which of the following equations has the sum of its roots as 3?

(a) $2x^2 - 3x + 6 = 0$

(b) $-x^2 + 3x - 3 = 0$

(c) $\sqrt{2}x^2 - \frac{3}{\sqrt{2}}x + 1 = 0$

(d) $3x^2 - 3x + 3 = 0$

58. The 21st term of the AP whose first two terms are -3 and 4 is

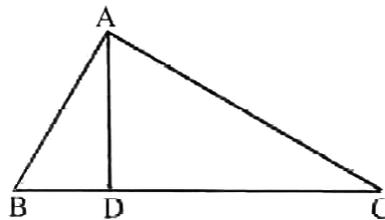
(a) 17

(b) 137

(c) 143

(d) -143

59. In Fig. $\angle BAC = 90^\circ$ and $AD \perp BC$. Then



(a) $BD \cdot CD = BC^2$

(b) $AB \cdot AC = BC^2$

(c) $BD \cdot CD = AD^2$

(d) $AB \cdot AC = AD^2$

60. The distance between the points $(0, 5)$ and $(-5, 0)$ is

(a) 5

(b) $5\sqrt{2}$

(c) $2\sqrt{5}$

(d) 10

Answer Key							
Engineering							
S.NO.	APTITUDE	S.NO.	PHYSICS	S.NO.	CHEMISTRY	S.NO.	MATHEMATICS
1	D	16	B	31	B	46	C
2	C	17	A	32	C	47	A
3	B	18	A	33	C	48	D
4	D	19	C	34	A	49	B
5	A	20	D	35	B	50	B
6	D	21	D	36	D	51	D
7	D	22	A	37	B	52	A
8	C	23	B	38	A	53	C
9	A	24	B	39	A	54	C
10	B	25	A	40	D	55	A
11	A	26	A	41	B	56	C
12	D	27	A	42	B	57	B
13	B	28	D	43	C	58	B
14	D	29	A	44	C	59	C
15	B	30	C	45	A	60	B