SAMPLE PAPER - 68

Time : 1 : 15 Hr.   **Question : 60**

PHYSICS

01. A body is projected at $60°$ with ground. It covers a horizontal distance of 100 m. If the same body is projected at $60°$ with vertical with same velocity, the new range is
(1) 50 m   (2) 100 m
(3) 200 m   (4) 150 m

02. An airplane moving horizontally with a speed of 180 km/hr drops a food packet while flying at a height of 500 m. The horizontal range is
(1) 180 m   (2) 980 m
(3) 500 m   (4) 670 m

03. The maximum height attained by a projectile is increased by 5%. Keeping the angle of projection constant, what is the percentage increase in horizontal range ?
(1) 5%   (2) 10%   (3) 15%   (4) 20%

04. Two astronauts are floating in gravitation free space after having lost contact with their spaceship. The two will
(1) keep floating at the same distance between them
(2) move towards each other
(3) move away from each other
(4) will become stationary

05. The force of gravitation is
(1) repulsive   (2) electrostatic
(3) conservative   (4) non-conservative

06. One can easily weigh the earth by calculating the mass of the earth by using the formula (in usual notation)

(1) $\dfrac{G}{g} R_e^2$ (2) $\dfrac{g}{G} R_e^2$ (3) $\dfrac{g}{G} R_e$ (4) $\dfrac{G}{g} R_e^3$

07. Three equal masses of 1 kg each are placed at the vertices of an equilateral ΔPQR and a mass of 2 kg is placed at the centroid O of the triangle which is at a distance of $\sqrt{2}$ m from each of the vertices of the triangle. The force, (in newton) acting on the mass of 2 kg is

(1) 2   (2) $\sqrt{2}$ (3) 1   (4) zero

08. Which of the following statements about the gravitational constant is true?
(1) It is a force
(2) It has no unit
(3) It has same value in all systems of unit
(4) It does not depend on the nature of the medium in which the bodies are kept

09. The weight of a body on the surface of the earth is 90 N. What is the gravitational force on it due to the earth at a height equal to half the radius of the earth?
(1) 35 N   (2) 28 N
(3) 18 N   (4) 40 N

10. Weightlessness experienced while orbiting the earth in spaceships, is the result of
(1) inertia   (2) acceleration
(3) zero gravity   (4) centre of gravity

11. What will happen to the weight of the body at the south-pole, if the earth stops rotating about its polar axis?
(1) No change
(2) Increases
(3) Decreases but not become zero
(4) Reduces to zero

12. At what altitude (h) above the earth's surface would the acceleration due to gravity be $\dfrac{1}{25}$ th of its value at the earth's surface?
(1) h = R   (2) h = 4 R
(3) h = 2 R   (4) h = 16 R

13. What is the maximum height attained by a body projected with a velocity equal to half of the escape velocity from the surface of the earth? (Radius of the earth = R)
(1) R/2   (2) R/3   (3) R/5   (4) R/8

14. Two planets A and B have the same material density. If the radius of A is thrice that of B, then the ratio of escape velocity $\dfrac{v_A}{v_B}$ is

(1) 3   (2) $\sqrt{3}$ (3) $\dfrac{1}{\sqrt{3}}$ (4) $\dfrac{1}{3}$

15. A planet orbiting in an orbit of radius R has a time period of revolution T. Find time period of a planet orbiting in an orbit of radius 9R?
(1) $3\sqrt{3}T$ (2) $9T$
(3) $27T$ (4) $9\sqrt{3}T$

CHEMISTRY

16. Mole fraction of the solvent in a 1.00 molal aqueous solution is
(1) 1.7700   (2) 0.1770
(3) 0.0177   (4) 0.9821

17. What does ΔH represent in
$X(g) + e^- \longrightarrow X^-(g); \Delta H = -x$?
(1) Ionization energy
(2) Electron gain enthalpy
(3) Electronegativity
(4) None of these

18. Select the correct statement(s) out of the following:
(1) Radius of Mg^{2+} is smaller than that of Mg
(2) Radius of Al^{3+} is smaller than that of Al
(3) Mg being larger in size than Al, it has largest size among Mg, Al, Mg^{2+} and Al^{3+}
(4) All are correct

19. Which of the following is correct w.r.t. $\Delta_{eg}H$?
(1) $Cl > F > Br > I$ (2) $S > Se > Te > O$
(3) Both (1) and (2)   (4) None is correct

20. Which of the following is the correct matching related to groups of p-block?

|	Column–I		Column–II
A.	Group 16	P.	Halogens
B.	Group 17	Q.	Noble gases
C.	Group 18	R.	Chalcogens

(1) A–P; B–Q; C–R   (2) A–R; B–P; C–Q
(3) A–Q; B–R; C–P   (4) A–R; B–Q; C–P

21. Select the incorrect statement
(1) d-block is in the extreme right of periodic table
(2) elements of d-block are commonly referred to as transition metals
(3) Zn, Cd and Hg have electronic configuration $(n-1)d^{10}\ ns^2$
(4) Zn, Cd and Hg belong to 12th group of periodic table.

22. After the discovery of element of atomic number 120, which group and period, respectively, will it belong to?
(1) 8, 9   (2) 1, 8
(3) 2, 8   (4) 2, 9

23. The correct IUPAC name of the following compound is :
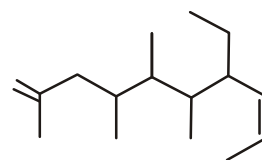
(1) 7-Ethyl-2, 4, 5, 6-tetramethyldeca-1, 8-diene
(2) 4-Ethyl-5, 6, 7, 9-tetramethyldeca-2, 9-diene
(3) 2, 4, 5, 6-tetramethy-7-ethyldeca-1, 7-diene
(4) None of these

24. The IUPAC name of
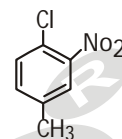
(1) 1-Chloro-2-nitro-4-methyl benzene
(2) 1-Chloro-4-methyl-2-nitrobenzene
(3) 2-Chloro-1-nitro-5-methyl benzene
(4) m-Nitro-p-chlorotoluene

25. Nylon threads are made of-
(1) Polymide polymer   (2) Polyethlene polymer
(3) Polyvinyl polymer   (4) Polyster polymer

26. Buna-N synthetic rubber is a copolymer of-
(1) $H_2C = CH - \overset{\underset{\displaystyle |}{Cl}}{C} = CH_2$ and $H_2C = CH - CH = CH_2$
(2) $H_2C = CH - CH = CH_2$ and $H_5C_6 - CH = CH_2$
(3) $H_2C = CH - CN$ and $H_2C = CH - CH = CH_2$
(4) $H_2C = CH - CN$ and $H_2C = CH - \overset{\underset{\displaystyle |}{CH_3}}{C} = CH_2$

27. Which of the following molecules represents the order of hybridisation sp^2, sp^2, sp, sp from right to left atoms?
(1) $CH_3 - CH = CH - CH_3$
(2) $CH \equiv C - CH = CH_2$
(3) $CH_2 = CH - C \equiv CH$
(4) $HC \equiv C - C \equiv CH$

28. Number of π bonds and σ bonds in the following structure is
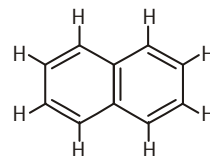
(1) 6, 19   (2) 4, 20   (3) 5, 19   (4) 5, 20

29. The IUPAC name of the compound having the formula $CH_2 = CH - C \equiv CH$ is
(1) 1-butyne-3-ene   (2) but-1-yne-3-ene
(3) 1-buten-3-yne   (4) 3-butene-1-yne

30. In allene (C_3H_4), the type(s) of hybridization of the carbon atoms is (are)
(1) sp and sp^3 (2) sp^2 and sp
(3) only sp^2 (4) sp^2 and sp^3

BOTANY

31. Where is apoplastic movement shifted to symplastic pathway?
(1) Cortex   (2) Endodermis
(3) Pericycle   (4) Xylem

32. The value of solute potential is:
(1) Always positive
(2) Always negative
(3) Some time negative
(4) Some time negative or positive

33. In thistle funnel experiment, during osmosis the level of the solution in the funnel
(1) Increases   (2) Decreases
(3) Remains same
(4) First increases then decreases

34. New cells generate from:
(1) Bacterial fermentation
(2) Regeneration of old cell
(3) Pre-existing cells
(4) Abiotic material

35. Which of the following structures is not found in prokaryotic cells?
(1) Plasma membrane   (2) Nuclear envelope
(3) Ribosome   (4) Mesosome

36. The three layers of the cell envelope arranged from outer to inner are:
(1) Glycocalyx, plasma membrane, cell wall
(2) Glycocalyx, cell wall, plasma membrane
(3) Cell wall, glycocalyx, plasma membrane
(4) Plasma membrane, glycocalyx, cell wall

37. The longest portion of the flagella is the:
(1) Basal body   (2) Hook
(3) Filament   (4) None of these

38. Which one occurs in both prokaryotic and plant cells?
(1) Nucleus   (2) Chloroplast
(3) Cell wall   (4) Mitochondria

39. Cell organelle present in both prokaryotic and eukaryotic cells is:
(1) Ribosome   (2) E.R.
(3) Mitochondria   (4) Nucleus

40. Prokaryotic ribosomes are:
(1) 50S   (2) 60S
(3) 70S   (4) 80C

41. Which of the following is an example of active transport across the plasma membrane?
(1) Water   (2) Na^+/K^+ pump
(3) Neutral solutes   (4) None of the above

42. Lysosomes are called suicidal bags because they have:
(1) Hydrolytic enzymes   (2) Parasitic activity
(3) Food vacuole   (4) Catabolic enzymes

43. Hydrolytic enzymes of lysosome function at:
(1) Acidic pH   (2) Alkaline pH
(3) Neutral pH   (4) Both (2) and (3)

44. Foldings of inner mitochondrial membrane are called:
(1) Grana   (2) Thylakoids
(3) Cristae   (4) $F_0 - F_1$ structures

45. Number of membranes separating intra thylakoid space from cytoplasm is:
(1) 4   (2) 3   (3) 2   (4) 1

ZOOLOGY

46. Which of the following layers are present in adrenal cortex from inner to outer?
(1) Zona reticularis, zonal fasciculata and zona glomerulosa.
(2) zona fasciculata, zona glomerulosa and zona reticularis.
(3) Zona glomerulosa, zona reticularis and zona fasciculata.
(4) Zona glomerulosa, zona fasciculata and zona retcularis.

47. Which of the following are effects of cortisol?
(1) Anti-inflammatory
(2) Immunosuppressant
(3) Increases RBC production
(4) All of these

48. Proventriculus is also known as
(1) Pharynx   (2) Oesophagus
(3) Crop   (4) Gizzard

49. In cockroach, excretion is performed by
(1) Seminiferous tubules   (2) Uriniferous tubules
(3) Malpighian tubules   (4) Rennet cells

50. Each compound eye of cockroach consists of how many ommatidia?
(1) 1000   (2) 2000   (3) 3000   (4) 4000

51. Cockroach has which type of mouth parts?
(1) Biting and chewing type
(2) Siphoning type
(3) Sponging type
(4) All of these

52. Where sperm is glued together in cockroach?
    (1) Seminal vesicle   (2) Phallomere
    (3) Ejaculatory duct   (4) None of these

53. Each ovary in cockroach is made up of how many ovarian tubules or ovarioles?
    (1) 6   (2) 4   (3) 8   (4) 10

54. How many oothecae are produced by female cockroach?
    (1) 9–10   (2) 14–16   (3) 13   (4) 1–2

55. Nymph of cockroach grows by moulting about _____ times to reach the adult form.
    (1) 12   (2) 11   (3) 13   (4) 10

56. Male and female cockroach is morphologically distinguished by the presence of
    (1) Anal cerci   (2) Anal style
    (3) Compound eyes   (4) All of these

57. Select the total number of organisms from the following which respire through their body surface.
    Sycon, Spongilla, Adamsia, Taenia, Laccifer, Pila, Antedon, Gorgonia, Jelly fish
    (1) 4   (2) 5   (3) 6   (4) 8

58. Trachea divides into right and left primary bronchi at _____ thoracic vertebra.
    (1) 4   (2) 5   (3) 6   (4) 9

59. Covering of the lungs is called
    (1) Perichondrium   (2) Pleural membrane
    (3) Pericardium   (4) Peritoneum

60. The part starting with the external nostrils up to the terminal bronchioles constitute the
    (1) Respiratory of respiratory system.
    (2) Exchange part of respiratory system.
    (3) Expiratory part
    (4) Conducting part of respiratory system.