iQuest Scholarship Cum Admission Test

FOR MOVING TO CLASS 12TH (EXCEL) SAMPLE TEST (MED.)

Time: 1.5 hrs	Max Marks : 240

SYLLABUS & SCHEME

| SUBJECTS	Qs.	SYLLABUS
PHYSICS	15	Class 11 syllabus till Gravitation
CHEMISTRY	15	Atomic, Periodic, Chemical Bonding, Redox, State of Matter
		Chemical Equilibrium, Mole Concept
BIOLOGY	30	Biological classification, Cell, Cell cycle, Biomolecules,
		Animal Kingdom, Plant Anatomy, Animal tissue,
		Plant Physiology till Respiration, Human Physiology till Excretion

INSTRUCTIONS TO CANDIDATE

➢ Each subject in this paper consists of multiple choice questions with only one correct answer. **+4 marks** will be awarded for correct answer and **–1 mark** for wrong answer.

➢ Please read the instructions given for each question carefully and fill the correct answer against the question numbers on the answer sheet in the respective subject.

➢ Use blue or black ball point pen to darken the appropriate circle & mark should completely fill the circle.

➢ The Question paper contains blank spaces for your rough work. No additional sheet will be provided for rough work.

➢ Blank papers, Clipboards, Log Tables, Slide rule, Calculators, Cellular phones, Pagers and Electronic gadgets in any form are not allowed.

➢ Write your Name, Student ID in the block at the top of the Answer Sheet. Also write your Name & Student ID in the space provided on this cover page of question paper.

➢ **This is a Sample Test Paper. The actual Paper Pattern may vary in terms of duration and sections. However the syllabus will be same.**

Name:_____Student ID_____

1. A particle is thrown vertically upwards from the surface of the earth. Let T_P be the time taken by the particle to travel from a point P above the earth to its highest point and back to the point P. Similarly, let T_Q be the time taken by the particle to travel from another point Q above the earth to its highest point and back to the same point Q. If the distance between the points P and Q is H, the expression for acceleration due to gravity in terms of T_P, T_Q and H, is :-
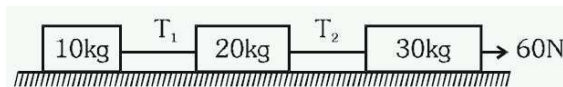
(A) $\dfrac{6H}{T_P^2 + T_Q^2}$

(B) $\dfrac{8H}{T_P^2 - T_Q^2}$

(C) $\dfrac{2H}{T_P^2 + T_Q^2}$

(D) $\dfrac{H}{T_P^2 - T_Q^2}$

2. An aeroplane is travelling horizontally at a height of 2000 m from the ground. The aeroplane, when at a point P, drops a bomb to hit a stationary target Q on the ground. In order that the bomb hits the target, What angle θ must the line PQ make with the vertical ? [$g = 10$ ms^{-2}]
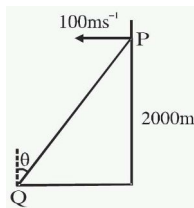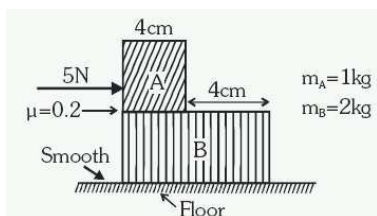

(A) 15°

(B) 30°

(C) 90°

(D) 45°

3. For the following system

(A) Acceleration of the system = 2m/s²

(B) $T_1 = 20$ N

(C) $T_2 = 10$N

(D) $T_2 > T_1$

4. For shown situation in figure (Assume : g = 10 ms^{-2})

(A) The acceleration of the block A is 1m/s²

(B) The acceleration of the block B is 3m/s²

(C) The time taken for the front face of A lining up with the front face of B is 0.25 sec

(D) The time taken for the front face of A lining up with the front face of B is 0.50 sec

5. Two equal masses are placed as shown in the figure. Friction at the pulley is negligible. If coefficient of sliding friction of the mass on the horizontal surface is 0.2 and if the hanging mass is just released from position of rest, the acceleration of the system, is (take $g = 9.8$ m/s²) :-
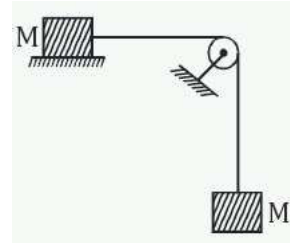
(A) 1 m/s²

(B) 2 m/s²

(C) 3.92 m/s²

(D) 4 m/s²

6. A block of mass 5kg is placed on horizontal surface, and a pushing force 20N is acting on block as shown in fig. If coefficient of friction between block and surface is 0.2 then frictional force and speed of block after 15 sec, are respectively :-
(Given $g = 10$ m/s²)
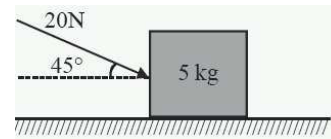
(A) $(5+2\sqrt{2})$N, $3.25\,\text{ms}^{-1}$

(B) $(10+2\sqrt{2})$N, $3.25\,\text{ms}^{-1}$

(C) $(5+2\sqrt{2})$N, $3.94\,\text{ms}^{-1}$

(D) $(10+2\sqrt{2})$N, $3.94\,\text{ms}^{-1}$

7. A particle of mass 'M' falls from height 'h' and gets stick after collision, with identical particle lying on sand. After sticking, both particles moves a distance d in sand, then the work done against retarding force of sand is :-

(A) $\dfrac{Mgh}{2} + 2Mgd$

(B) $\dfrac{Mgh}{2} + Mgd$

(C) $\dfrac{Mgh}{2} - 2Mgd$

(D) $\dfrac{Mgh}{2} - Mgd$

8. A body is dropped from height 8m. After striking the surface it rises to 6m, the fractional loss in kinetic energy during impact, is (Assuming the frictional resistance to be negligible)

(A) $\dfrac{1}{2}$

(B) $\dfrac{1}{4}$

(C) $\dfrac{1}{5}$

(D) $\dfrac{1}{7}$

9. A body of mass 0.8 kg has initial velocity $(3\hat{i} - 4\hat{j})$ m/sec. and final velocity $(-6\hat{j} + 2\hat{k})$ m/sec, the change in kinetic energy of the body is :

(A) 2 J

(B) 3 J

(C) 4 J

(D) 6 J

10. A chain of mass m and length L is held on a frictionless table in such a way that its $\dfrac{1}{n}$th part is hanging below the edge of table. The work done to pull the hanging part of chain is :-

(A) $\dfrac{mgL^2}{2n^2}$

(B) zero

(C) $\dfrac{mgL}{2n}$

(D) $\dfrac{mgL}{2n^2}$

11. The angle between angular momentum and linear momentum for a particle in motion is :-

(A) 0°

(B) 90°

(C) 45°

(D) 180°

12. Two identical rods each of mass M and length L are kept according to figure. The moment of inertia of rods about an axis passing through O and perpendicular to the plane of rods, is :-
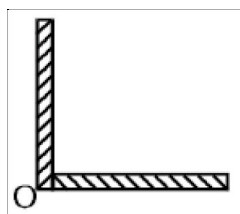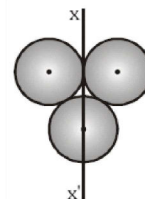

(A) $\dfrac{1}{3}ML^2$

(B) $\dfrac{2}{3}ML^2$

(C) $2ML^2$

(D) $\dfrac{1}{2}ML^2$

13. A flywheel rotates with a uniform angular acceleration. Its angular velocity increases from 20π rad/s to 40π rad/s in 10 seconds. The number of rotations, it made in this period are :

(A) 100

(B) 150

(C) 200

(D) 250

14. Three identical rings of mass 'M' and radius 'R' are placed shown in figure. The moment of inertia about axis xx' is :

(A) $\dfrac{5}{2}MR^2$

(B) $\dfrac{7}{2}MR^2$

(C) $\dfrac{3}{2}MR^2$

(D) $\dfrac{9}{2}MR^2$

15. A disc is rotating with angular velocity (ω) about its axis (without any translation push) on a smooth surface : The directions and magnitudes of velocity at points B and A are :
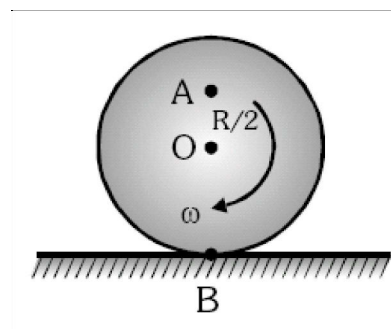
(A) $V_A = +\dfrac{\omega R}{2}$ (Towards right), $V_B = -\omega R$ (Towards left)

(B) $V_A = -\omega R$ (Towards right), $V_B = \dfrac{\omega R}{2}$ (Towards left)

(C) $V_A = +\dfrac{\omega R}{4}$ (Towards right), $V_B = -\omega R$ (Towards left)

(D) $V_A = +\dfrac{\omega R}{2}$ (Towards right), $V_B = \dfrac{\omega R}{2}$ (Towards left)

16. For the redox reaction,

$MnO_4^- + C_2O_4^{2-} + H^+ \longrightarrow Mn^{2+} + CO_2 + H_2O$

The correct coefficients of the reactants for the balanced reaction are -

$MnO_4^- \quad C_2O_4^{2-} \quad H^+$

(A) 2 5 16   (B) 16 5 2

(C) 5 16 2   (D) 2 16 5

17. The oxidation state of S in $Na_2S_4O_6$ is -

(A) +2   (B) +4

(C) +6   (D) +2.5

18. The empirical formula of a compound is CH. Its molecular weight is 78. The molecular formula of the compound will be :

(A) C_2H_2 (B) C_3H_3

(C) C_4H_4 (D) C_6H_6

19. In a given shell the order of screening effect is

(A) s > p > d > f   (B) s > p > f > d

(C) f > d > p > s   (D) p > s > d > f

20. Which one of the following sets of ions represents the collection of isoelectronic species?

(A) Na^+, Mg^{2+}, Al^{3+}, F^- (B) K^+, Ca^{2+}, Sc^{3+}, Cl^-

(C) K^+, Cl^-, Mg^{2+}, Sc^{3+} (D) (A) and (B) both

21. Which of the following molecule deviates from octet rule with respect to central atom

(A) PCl_3 (B) H_2S

(C) NH_3 (D) XeF_4

22. The correct order of increasing C-O bond length of CO, CO_3^{2-}, CO_2 is

(A) $CO_3^{2-} < CO_2 < CO$

(B) $CO_2 < CO_3^{2-} < CO$

(C) $CO < CO_3^{2-} < CO_2$

(D) $CO < CO_2 < CO_3^{2-}$

23. The percentage of Carbon in CO_2 is

(A) 27.27%   (B) 29.27%

(C) 30.27%   (D) 26.97%

24. $\dfrac{K_p}{K_c}$ for the given reaction will be

$2CO(g) + O_2(g) \rightleftharpoons 2CO_2(g)$ is

(A) RT   (B) $\dfrac{1}{RT}$

(C) $\dfrac{1}{\sqrt{RT}}$ (D) $\sqrt{RT}$

25. The empirical formula of a gaseous compound is CH_2. The density of the compound is 1.25 gm/lit. at S.T.P. The molecular formula of the compound is X

(A) C_2H_4 (B) C_3H_6

(C) C_6H_{12} (D) C_4H_8

26. Most probable velocity, average velocity and root mean square velocity are related as

(A) 1:1.128 :1.224   (B)1:1.128:1.424

(C)1:2.128:1.224   (D)1:1.428:1.442

27. Which mixture of gases at room temperature does not obey Dalton's law of parttarpressure'

(A) NO_2 and O_2 (B) NH_3 and HCI

(C) CO and CO_2 (D) SO_2 and SO_3

28. If the radius of first orbit of H is r, then the radius of first Bohr's orbit of Li^{2+} will be -

(A) 3 r   (B) 27 r

(C) $\dfrac{r}{27}$ (D) $\dfrac{r}{3}$

29. For the non-zero volume of molecules having no forces of attraction, the variaion of compressibility factor $Z = \dfrac{PV}{RT}$ with pressure is given by the graph

(A) I

(B) II

(C) III

(D) IV
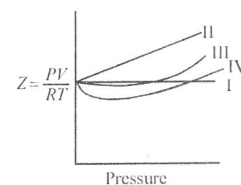
30. A reversible chemical reaction having two reactants in equilibrium. If the concentration of the reactants are doubled, then the equilibrium constant will

(A) Also be doubled   (B) Be halved

(C) Become one-fourth   (D) Remain the same

31. Which of the following elements are macronutrients? Co, Ba, Mg, S, I, Mn
(A) I and Mn
(B) Mg and S
(C) Co, Mg and Mn
(D) Co and Mn

32. In C4 plants, dimorphism of chloroplasts is an adaptation to:
(A) absorb light efficiently.
(B) absorb light in blue-violet and red regions.
(C) carry out cyclic and non-cyclic electron transfer.
(D) minimize photorespiration.

33. Fascicular cambium is the cambium of vascular bundle of :
(A) monocot stem
(B) dicot stem
(C) monocot leaf
(D) dicot leaf

34. Companion cells in plants are associated with :
(A) vessels
(B) sperms
(C) sieve elements
(D) guard cell

35. Gram positive bacteria will have one of the specific characters. Identify it.
(A) They have more peptidoglycon in their cell walls.
(B) They show red colour on gram staining.
(C) Flagella found all over the body.
(D) They will have mesosomes as the extension of cell membrane.

36. Cork cambium results in the formation of cork which becomes impermeable to water due to the accumulation of :
(A) resins
(B) suberin
(C) lignins
(D) tannins

37. Mitochondrial equivalent in prokaryotic bacterial cell is
(A) ribosomes
(B) thylakoid
(C) cytoplasmic plasma membrane
(D) cyanosomes

38 Which one of the following statements pertaining to plant structure is correct ?
(A) Cork have stomata but lenticels carry out transpiration
(B) Passage cells help in transfer of food from cortex to phloem
(C) Sieve tube elements possess cytoplasm but no nuclei
(D) The shoot apical meristem has a quiescent centre

39. Viruses that infect bacteria multiply and cause their lysis, are called :
(A) lysozymes
(B) lipolytic
(C) lytic
(D) lysogenic

40. Which of the following enzymes involved in Krebs cycle is not present in the mitochondrial matrix?
(A) Aconitase
(B) Malate dehydrogenase
(C) Fumarase
(D) Succinate dehydrogenase

41. These organisms are fungus like in one phase of their life cycle and *Amoeba* like in another phase of their life cycle
(A) diatoms
(B) slime molds
(C) dinoflagellates
(D) water molds

42. Air dried seeds and dry wood were soaked in water. After a day both of them were found to be swollen. Which of the following inference is correct?
(A) Dry wood absorbed water by imbibition for few hours and thereafter by osmosis
(B) Dried seeds absorbed water only by osmosis
(C) Dried seeds absorbed water imbibition for few hours and thereafter by osmosis
(D) Both of them absorbed water by osmosis and imbibition simultaneously

43. Cells of E. coli are placed in a solution with 12% NaCl. Which effect would be visible after 24 h of incubation?
(A) Plasmolysis
(B) Plasmoptysis
(C) Osmotic lysis
(D) Swelling of cells

44. Plant scientists are worried that C4 crops such as corn and sugarcane may suffer stiffer competition from C3 weeds since there is a global
(A) Increase in temperature
(B) Increase in CO_2 content of atmosphere
(C) Decrease in rainfall
(D) Increase in genome contamination of C4 crops

45. Mesophyll is usually differentiated in :
(A) monocot leaf
(B) isobilateral leaf
(C) dorsiventral leaf
(D) both (A) and (B)

46. The term 'anadromous' in relation to salmons and hilsa pertains to their

(A) reproduction and excretion

(B) respiration

(C) migration and spawning

(D) maturation of gonads

47. Match the following host with their parasites

1. *Taenia*   A. Pig
2. Liverfluke   B. *Aedes aegypti*
3. *Ascaris*   C. Snail
4. Plague   D. Dog
5. Rabies   E. None of the five
                       animals
6. Dengue   F. Ratflea

	1	2	3	4	5	6
(A)	F	A	E	B	D	C
(B)	A	C	E	F	D	B
(C)	A	B	C	D	E	F
(D)	F	E	B	A	C	D

48. Animals belonging to the following groups are usually hermaphrodites except:

(A) gastropods   (B) oligochaetes

(C) crustaceans   (D) flatworms

49. Iron free compound in Hb is

(A) globin   (B) haematin

(C) bilirubin   (D) cyanin

50. The commonest and smallest type of leucocyte in a healthy adult man is

(A) lymphocytes   (B) monocytes

(C) eosinophils   (D) basophils

51. Which of the following is not a structural protein?

(A) Fibrin   (B) Albumin

(C) Collagen   (D) Keratin

52. One of the following refers to 'feed back mechanism', the effect of

(A) change in pH and temperature on enzyme substrate complex

(B) end product concentration on the rate of enzymatic reactions

(C) substrate concentration on the rate of enzymatic reactions

(D) enzymes concentration on the rate of reaction

53. A competitive inhibitor of an enzyme has which of the following properties ?

(A) It is frequently a feedback inhibitor

(B) It becomes covalently attached to an enzyme

(C) it interferes with substrate binding to the enzyme

(D) It causes reversible inactivation of the enzyme

54. Muscle of Boyden and muscle of Oddi are related to

(A) pancreas   (B) uvula

(C) stomach   (D) intestine

55. Functional residual capacity and inspiratory capacity when added together give

(A) breathing reserve   (B) total lung capacity

(C) vital capacity

(D) maximum voluntary ventilation

56. The correct match is

Blood Groups	Plasma antibodies
A. A	I. a and b
B. B	II. b
C. O	III. a
D. AB	IV. nil.

	A	B	C	D
(A)	I	II	III	IV
(B)	II	III	I	IV
(C)	IV	III	II	I
(D)	III	I	II	IV

57. Pick up the correct match

A. Oxyntic cells	I. Bile
B. Wirsung duct	II. HCl
C. Brunner's glands	III. Pancreatic hormones
D. Fat digestion	IV. Pancreas
E. α, β, δ cells	V. Duodenum

	A	B	C	D	E
(A)	I	II	III	IV	V
(B)	II	IV	V	I	III
(C)	V	IV	III	II	I
(D)	II	I	III	IV	V

58. The total number of lobes and alveoli present in both the lungs of man is

(A) 17 and 30 million, respectively

(B) 5 and 300 million, respectively

(C) 19 and 300 million, respectively

(D) 18 and 300 lakh, respectively

59. The various parts of the human respiratory system are given below:

(i) Nasal passage (ii) Pharynx

(iii) Wind pipe (iv) Bronchus

(v) Bronchioles (vi) Alveoli

Identify the right sequence of air passage during exhalation.

(A) vi, v, ii, iv, iii, i (B) vi, iv,v, iii, ii, i

(C) vi, v, iv, iii, ii, i (D) vi, v, ii, iii, iv, i

60. If one compares physiology of an elephant and cat, then:

(A) the heart beats per minute of a cat will be higher than an elephant.

(B) the total heart beats in the lifetime of an elephant will be many times that of a cat.

(C) both cat and elephant will show heart rate greater than a chicken.

(D) elephant will show greater surface to volume ratio as compared to a cat.

ANSWER KEY

PHYSICS

1.	(B)	2.	(D)	3.	(D)	4.	(C)	5.	(C)	6.	(D)
7.	(A)	8.	(B)	9.	(D)	10.	(D)	11.	(A)	12.	(B)
13.	(B)	14.	(B)	15.	(A)								

CHEMISTRY

16.	(A)	17.	(D)	18.	(D)	19.	(A)	20.	(D)	21.	(D)
22.	(D)	23.	(A)	24.	(B)	25.	(A)	26.	(A)	27.	(B)
28.	(D)	29.	(B)	30.	(D)								

BOTANY

31.	(B)	32.	(D)	33.	(B)	34.	(C)	35.	(A)	36.	(B)
37.	(C)	38	(C)	39.	(C)	40.	(D)	41.	(B)	42.	(C)
43.	(A)	44.	(B)	45.	(C)								

ZOOLOGY

46.	(C)	47.	(B)	48.	(C)	49.	(A)	50.	(A)	51.	(B)
52.	(B)	53.	(C)	54.	(A)	55.	(B)	56.	(B)	57.	(B)
58.	(B)	59.	(C)	60.	(A)								