KELVIN

IIT-JEE | MEDICAL | FOUNDATIONS

KELVIN Entrance Test (KET)

Class : 12th Passed (Medical)

Code : A

Time : 80 minutes **MM : 228**

Registration Number : .....

Name of the Candidate : .....

Test Centre : .....

Instructions :

Caution : Class, Paper, Code as given above must be correctly marked in the answer OMR sheet before attempting the paper. Wrong Class, Paper or Code will give wrong results.

1. This question paper consists of 60 questions. All questions will be multiple choice single correct out of four choices with marking scheme in table below.

Subject	Question No.	Marking scheme for each question	
		Correct Answer	Incorrect Answer
PHYSICS	Q. 1-6	+3	0
	Q. 7-12	+4	0
	Q. 13-15	+5	0
CHEMISTRY	Q. 16-21	+3	0
	Q. 22-27	+4	0
	Q. 28-30	+5	0
BIOLOGY	Q. 31-42	+3	0
	Q. 43-54	+4	0
	Q. 55-60	+5	0

2. Answers have to be marked on the OMR sheet. The Question Paper contains blank spaces for your rough work. No additional sheets will be provided for rough work.

3. Blank papers, clip boards, log tables, slide rule, calculator, cellular phones, pagers and electronic devices, in any form, are not allowed.
4. Before attempting paper write your Registration Number, Name and Test Centre in the space provided at the top of this sheet.
5. See method of marking of bubbles of the back of cover page for question no. 1 to 60.

Note : Please check this Question Paper contains all 60 questions in serial order. If not so, exchange for the correct Question Paper.

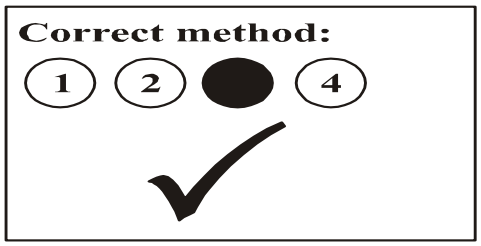
Method of marking of bubbles for questions number 1 to 60.

For example :

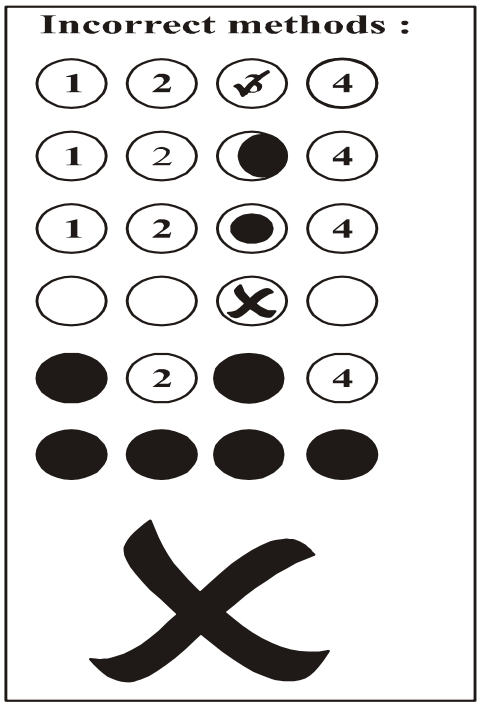
Question number 19 :

If correct option is 3, then

Correct method:



Incorrect methods :



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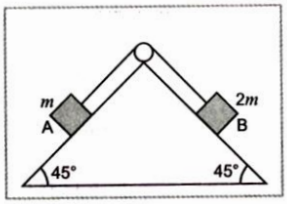
PHYSICS

1. Consider the fig. Shown below in which two masses of m and 2m are placed on a fixed triangular wedge.

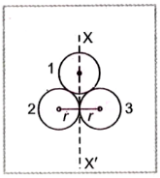


The coefficient of friction between block A and the wedge is 2/3, while that for block B and the wedge is 1/3.If the whole system is released from rest, then acceleration of block A is

(a) zero (b) $\frac{2m^2}{3}g$

(c) $\frac{4m^2}{3}g$ (d) $\frac{m^2}{\sqrt{2}}g$

2. Three identical spherical shell each of mass *m* and radius *r* are placed as shown in Fig Consider an axis XX' which is touching the two shells and passing through diameter of third shell. Moment of Inertia of the system consisting of these three spherical shells about XX' as axis is :



(a) $3\,mr^2$ (b) $\frac{16}{5}mr^2$

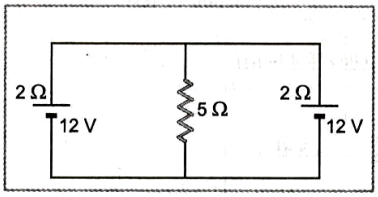
(c) $4\,mr^2$ (d) $\frac{11}{5}mr^2$

3. Two point charges + 8 *q* and – 2 *q* are located at $x = 0$ and $x = L$ respectively. The location of a point on X-axis at which the net electric field due to these two point charge is zero is :

(a) $2\,L$ (b) $L/4$

(c) $8\,L$ (d) $4\,L$

4. In the arrangement shown in Fig the current through 5 Ω resistor is



(a) 2A (b) zero

(c) $\frac{12}{7}$ A (d) 1A

5. The current I ampere is flowing in an equilateral triangle of side *a* the magnetic field induction at the centroid will be

(a) $\frac{9\,\mu_0 I}{2\,\pi a}$ (b) $\frac{5\sqrt{2}\mu_0 I}{3\,\pi a}$

(c) $\frac{3\,\mu_0 I}{2\,\pi a}$ (d) $\frac{\mu_0 I}{3\sqrt{3}\pi a}$.

6. A 50 Hz AC current of crest value 1 A flows through the primary of a transformer. If the mutual inductance between the primary and secondary be 0.5 H, the crest voltage induced in the secondary is

(a) 75 V (b) 150 V

(c) 100 V (d) none of these

7. A particle moving along X – axis has acceleration *f*, at time *t*, given by $f = f_0\left(1 - \frac{t}{T}\right)$, here f_0 and T and constants. The particle at $t = 0$ has zero velocity. In the time interval between $t = 0$ and the instant when $f = 0$, the particle velocity (v_x) is

(a) $\frac{1}{2}f_0\,T^2$ (b) $f_0 T^2$

(c) $\frac{1}{2}f_0\,T$ (d) $f_0\,T$

8. A monoatomic gas at pressure P_1 volume V_1 is compressed adiabatically to $\frac{1}{8}$th of its original volume. What is the final pressure of the gas?

(a) $64\,P_1$ (b) P_1

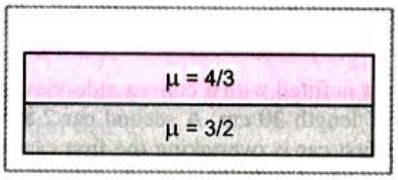
(c) $16\,P_1$ (d) $32P_1$

9. If potential (in volts) in a region is expressed as $V\,(x, y, z) = 6xy - y + 2yz$, the electric field (in N/C) at point $(1, 1, 0)$ is :

(a) $(-6\,\hat{\imath} + 9\,\hat{\jmath} + \hat{k})$
(b) $(-3\,\hat{\imath} + 5\,\hat{\jmath} + 3\,\hat{k})$
(c) $-(6\,\hat{\imath} + 5\,\hat{\jmath} + 2\,\hat{k})$
(d) $(-2\,\hat{\imath} + 3\,\hat{\jmath} + \hat{k})$

10. Two similar coils of radius *R*, are lying concentrically with their planes at right angles to each other. The currents flowing in them are I and 2 I respectively. The resultant magnetic field at the centre will be
(a) $\frac{\sqrt{5}\mu_0 I}{2R}$ (b) $\frac{3\,\mu_0 I}{2R}$
(c) $\frac{\mu_0 I}{2R}$ (d) $\frac{\mu_0 I}{R}$

11. Considering normal incidence of ray, the equivalent refractive index of combination of two slabs shown in Fig is

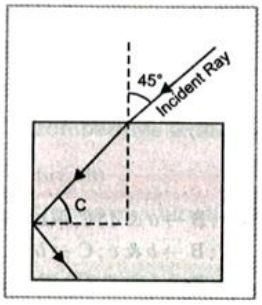


(a) 1.8 (b) 1.43
(c) 2 (d) none of the above

12. Two radioactive substances A and B have decays constants 5 λ and λ respectively. At *t* = 0, they have the same number of nuclei. The ratio of number of nuclei of A to those of B will $(1/e)^2$ after a time
(a) 4 λ (b) 2 λ
(c) $\frac{1}{2\lambda}$ (d) $\frac{1}{4\lambda}$

13. Two spherical bodies of mass *M* and 5 *M* and radii *R* and 2 *R* are released in free space with initial separation between their centres equal to 12 *R*. If they attract each other due to gravitational force only, then the distance covered by the smaller body before collision is
(a) 2.5 *R* (b) 4.5 *R*
(c) 7.5 *R* (d) 1.5 *R*

14. Four a given incident ray as shown in Fig the condition of total internal reflection of ray will be satisfied if the refractive index of the block will be



(a) $\frac{\sqrt{3}+1}{2}$ (b) $\frac{\sqrt{2}+1}{2}$
(c) $\sqrt{\frac{3}{2}}$ (d) $\sqrt{\frac{7}{6}}$

15. Three point charges + q, – 2 q and + q are placed at point $(x = 0, y = a, z = 0)$; $(x = 0, y = 0, z = 0)$ and $(x = a, y = 0, = 0)$ respectively. The magnitude and direction of the electric dipole moment vector of this charge assembly are :
(a) $(\sqrt{2}q\ a)$ along the line joining point $(x = 0,\ y = 0, z = 0)$ and $(x = a, y = a, z = 0)$
(b) $(q\ a)$ along the line joining points $(\mathrm{x}— 0, \mathrm{y} = 0, \mathrm{z} = 0)$ and$(x = a, y = a, z = 0)$
(c) $(\sqrt{2}q\ a)$ along $+ x$ direction,
(d) $(\sqrt{2}q\ a)$ along $+ y$ direction.

CHEMISTRY

16. Which of the following is a soda ash?
(a) $Na_2CO_3 \cdot 10H_2O$ (b) $Na_2CO_3 \cdot 7H_2O$
(c) $Na_2CO_3 \cdot 6H_2O$ (d) Na_2CO_3

17. Which of the following will give H_2 gas with Na?
(a) CH_4 (b) C_2H_6
(c) C_2H_4 (d) C_2H_2

18. Most crystals show good cleavage because their atoms, ions or molecules are
(a) Weakly bonded together
(b) Strongly bonded together
(c) Spherically symmetrical
(d) Arranged in planes

19. If the dispersed phase is a liquid and the dispersion medium is solid, the colloid is known as a/ an

(a) gel (b) emulsion
(c) sol (d) foam

20. Conversion of ethyl alcohol into acetaldehyde is an example of
(a) Hydrolysis
(b) Oxidation
(c) Reduction
(d) Molecular rearrangement

21. Most acidic oxide is
(a) Na_2O (b) ZnO
(c) MgO (d) P_2O_5

22. The ratio of charge and mass would be greater for
(a) proton (b) electron
(c) neutron (d) α-particle

23. A liquid decomposes at its normal pressure. It can be purified by
(a) sublimation
(b) vacuum distillation
(c) fractional distillation
(d) steam distillation

24. A solution of H_2SO_4 whose 9.8 g is dissolved in 2 litre of water has molarity
(a) 0.1 M (b) 0.05 M
(c) 0.01 M (d) 0.2 M

25. Which of the following is an example of vic-dihalide ?
(a) Dichloromethane
(b) 1, 2-dichlorethane
(c) Ethylidene chloride
(d) Allyl chloride

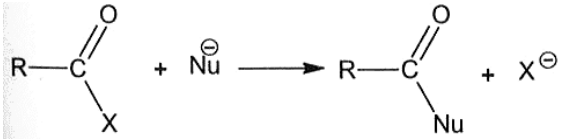
26. Oxidation number of Fe in Fe_3O_4 is
(a) $\frac{3}{2}$ (b) $\frac{4}{5}$
(c) $\frac{5}{4}$ (d) $\frac{8}{3}$

27. Which process represents the change,
$Ti + 2I_2 \rightarrow TiI_4 \rightarrow Ti + 2I_2$
(a) Cupellation (b) van Arkel
(c) Poling (d) Zone refining

28. The pH at which $Mg(OH)_2$ begins to precipitate from a solution containing 0.10 M Mg^{2+} ions (K_{sp} of $Mg(OH)_2 = 1 \times 10^{-11}$) is
(a) 5 (b) 9
(c) 4 (d) 10

29. $Zn \mid Zn^{2+}(C_1) \| Zn^{2+}(C_2) \mid Zn$ For this cell ΔG is negative if
(a) $C_1 = C_2$ (b) $C_1 > C_2$
(c) $C_2 > C_1$ (d) None of these

30. The reaction



is fastest when X is
(a) Cl (b) an enamine
(c) OC_2H_5 (d) OCOR

BIOLOGY

31. ABO-blood group in man is controlled by
(a) Multiple alleles
(b) Multiple cells
(c) Sex-linked genes
(d) Y-linked genes

32. Humus is
(a) Completely decomposed organic matter
(b) Partially decomposed organic matter
(c) Partially decomposed inorganic matter
(d) Completely decomposed inorganic matter

33. Monascus purpureus is a yeast used commercially in the production of
(a) Ethanol
(b) Streptokinase
(c) Citric acid
(d) Blood cholesterol lowering agent

34. Blue – green algae (BGA) are chiefly used as fertilizer for
(a) Wheat (b) Paddy
(c) Mustard (d) Gram

35. De Vries gave his mutation theory on organic evolution while working on:
(a) Althea rosea
(b) Drosophila melanogaster
(c) Oenothera lamarckiana
(d) Pisumsativum

36. Filiform apparatus plays an important role in
    (a) Guiding pollen tubes into synergids
    (b) Provide nutrition to male gametes
    (c) Provide protection to egg
    (d) Prevent the entry of pollen tube
37. Drawback of DDT as pesticide is
    (a) It becomes ineffective after spraying
    (b) It is less effective than others
    (c) It is not easily degraded in nature
    (d) Its high cost
38. Which of the following is not used for disinfection of drinking water?
    (a) Phenyl
    (b) Chloramine
    (c) Chlorine
    (d) Ozone
39. An acromian process is characteristically found in the :
    (a) Pelvic girdle of mammals
    (b) Skull of frog
    (c) Pectoral girdle of mammals
    (d) Sperm of mammals
40. A woman with 47 chromosomes due to three copies of chromosome 21 is characterize by :
    (a) Down syndrome
    (b) Triploidy
    (c) Turner syndrome
    (d) Super femaleness
41. Four healthy people in their twenties got involved in injuries resulting in damage and death of a few cells of the following. Which of the cells are least likely to be replaced by new cells?
    (a) Osteocytes
    (b) Malpighian layer of the skin
    (c) Liver cells
    (d) Neurons
42. AIDS is caused by HIV that principally infects:
    (a) All lymphocytes (b) Activator B cells
    (c) T_4 Lymphocytes (d) Cytotoxic T cells
43. Epithelial cells of the intestine involved in food absorption have on their surface:
    (a) Pinocytic vesicles
    (b) Phagocytic vesicles
    (c) Zymogen granules
    (d) Micro-villi
44. A patient is generally advise to specially, consume more meat, lentils, milk and eggs in diet only when he suffers from:
    (a) Kwashiorkor (b) Rickets
    (c) Anaemia (d) Scurvy
45. Phycoerythrin pigment is predominantly found in the members of
    (a) Green algae (b) Red algae
    (c) Brown algae (d) Chrysophytes
46. The acrosome of the sperm is formed by
    (a) Golgi complex (b) Cytoplasm
    (c) Nucleolus (d) ER
47. Dictyosome is the another name for _____
    (a) Golgi complex (b) Lysosome
    (c) Ribosome (d) Plastid
48. The process of removing stamens of a flower during hybridization is called
    (a) Hybridization (b) Emascualtion
    (c) Sterilization (d) Crossing
49. The main function of genetic code is to

Space for Rough work

(a) Determine the sequence of amino acids in a polypeptide chain
(b) Activate amino acids and to link them to tRNA
(c) Determine the structure of ribosomes
(d) Determine the secondary structure of protein molecules

50. Worker bees are
(a) Fertile males (b) Fertile females
(c) Sterile females (d) Sterile males

51. Microorganisms useful in biogas production is
(a) Spirulina (b) Methanobacterium
(c) Chlorella (d) Nostoc

52. One of the examples of the action of the autonomous nervous system is:
(a) Knee –jerk response
(b) Papillary reflex
(c) Swallowing of food
(d) Peristalsis of the intestines

53. Individuals of a species which occur in a particular area constitute
(a) Flora (b) Fauna
(c) Population (d) Flora and fauna

54. Succession beginning in ponds, lakes, etc., are called
(a) Hydrosere (b) Xerosere
(c) Subsere (d) Prisere

55. Chemiosmotic theory of ATP synthesis in the chloroplasts and mitochondria is based on:
(a) Proton gradient
(b) Accumulation of K ions
(c) Accumulation of Na ions
(d) Membrane potential

56. Parkinson's disease (characterized by tremors and progressive rigidity of limbs) is caused by degeneration of brain neurons that are involved in movement control and make use of neurotransmitter:
(a) Acetylcholine (b) Norepinephrine
(c) Dopamine (d) GABA

57. Which of the following is the relatively most accurate method for dating of fossils?
(a) Potassium –argon method
(b) Uranium –lead method
(c) Electron –spin resonance method
(d) Radio –carbon method

58. Secretin and Cholecystokinin are digestive hormones. They are secreted in:
(a) Oesophagus (b) Ileum
(c) Duodenum (d) Pyloric stomach

59. Which of the following unicellular organism has macro –nucleus for trophic function and one or more micro – nuclei for reproduction?
(a) Euglena (b) Amoeba
(c) Paramecium (d) Trypansoma

60. Which part of the human ear plays no role in hearing as such but is otherwise very much required?
(a) Ear ossicles
(b) Eustachian tube
(c) Organ of Corti
(d) Vestibular apparatus

Space for Rough work

ANSWER KEY

PHYSICS

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

CHEMISTRY

16	D	**26**	D
17	D	**27**	B
18	D	**28**	B
19	A	**29**	C
20	B	**30**	A
21	D		
22	B		
23	D		
24	B		
25	B		

BIOLOGY

31	A	**41**	D	**51**	B
32	A	**42**	C	**52**	D
33	D	**43**	D	**53**	C
34	B	**44**	A	**54**	A
35	C	**45**	B	**55**	A
36	A	**46**	A	**56**	C
37	C	**47**	A	**57**	C
38	A	**48**	B	**58**	C
39	C	**49**	A	**59**	C
40	A	**50**	C	**60**	D