Resonance
Pre-foundation Career Care Programmes (PCCP) Division
(A Unit of Resonance Eduventures Pvt. Ltd.)

CODE
3

KISHORE VAIGYANIK PROTSAHAN YOJANA

PRACTICE PAPER# 3

CLASS-XI

Time : 3 Hr. **Max. Marks : 100**

GENERAL INSTRUCTIONS

1. The question paper consists of two parts (**Part- A** contains multiple choice questions and **Part- B** contains descriptive type questions) for 100 marks. It consists of 40 questions of 1 mark each and 12 questions of 5 marks each. There will be four sections allotted for (1) Mathematics, (2) Physics, (3) Chemistry and (4) Biology. All questions are compulsory.

2. The question paper CODE is printed on the right hand top corner on this sheet of this booklet.

3. The composition of the question paper is given in the table below :

Sl. No.	Subjective	Part-A (Objective Type)	Part-B (DescriptiveType)
1	Mathematics	10 questions - 1 mark each	03 questions - 5 marks each
2	Physics	10 questions - 1 mark each	03 questions -- 5 marks each
3	Chemistry	10 questions - 1 mark each	03 questions - 5 marks each
4	Biology	10 questions - 1 mark each	03 questions - 5 marks each

4. The answer paper for **'Part-A'** is machine readable. Do not forget to mention your paper code and **Roll Number** neatly and clearly in the blank space provided in the **Objective Response Sheet (ORS)/Answer Sheet.**

5. For each question, indicate your answer by filling the corresponding oval with a HB pencil only.

6. There is **negative marking** for wrong answers in Part - A. Unanswered questions will not be evaluated and will not be penalized as a wrong answer.

7. In Part - A each correct answer gets 1 mark and for each incorrect answer **0.25 mark will be deducted.**

8. In **Part - B** each correct answer gets 5 marks. There will be no negative marking for **Part - B**. Part-B will be evaluated only for the top 50 students based on the marks obtained in **Part - A.**

9. You are permitted to use a non programable calculator.

10. Kindly note that both **'Part-A' ORS Sheet** and **'Part-B' booklet** have to be returned to the invigilator at the end of the respective sessions.

11. Candidates are permitted to carry only the 'Part-A' question paper after the examination.

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PRACTICE PAPER-3

PART-A (1 Mark)

MATHEMATICS

1. The real numbers x satisfying $\frac{\sqrt{x+5}}{1-x} > 1$ are precisely those which satisfy

(A) $x < 1$ (B) $0 < x < 1$ (C) $-5 < x < 1$ (D) $-1 < x < 1$

2. Let t_n denote the number of integral sided triangle with distinct sides chosen from {1, 2, 3 ———n). Then $t_{20} - t_{10}$ equals

(A) 81 (B) 153 (C) 163 (D) 173

3. The number of pairs of reals (x, y) such that $x = x^2 + y^2$ and $y = 2xy$ is

(A) 4 (B) 3 (C) 2 (D) 1

4. How many positive real number x satisfy the equation
$x^3 - 3|x| + 2 = 0$?

(A) 1 (B) 3 (D) 4 (D) 6

5. Let $(1 + 2x)^{20} = a_0 + a_1x + a_2x^2 + ... + a_{20}x^{20}$. Then, $3a_0 + 2a_1 + 3a_2 + 2a_3 + 3a_4 + 2a_5 + ... 2a_{19} + 3a_{20}$. equals to :

(A) $\frac{5.3^{20} - 3}{2}$ (B) $\frac{5.3^{20} + 3}{2}$ (C) $\frac{5.3^{20} + 1}{2}$ (D) $\frac{5.3^{20} - 1}{2}$

6. let P_1, P_2, P_3, P_4, P_5 be five equally spaced points on the circumfercence of a circle of radius 1, centred at O. Let R be the set of point in the plane of the circle that are closer to O than any of P_1, P_2, P_3, P_4, P_5 Then R is a -

(A) circular region (B) rectangular region
(C) pentagonal region (D) oval region that is not circular

7. A company situated at (2,0) in the xy-plane charges Rs. 2 per km for delivery. A second company at (0,3) chargs Rs. 3 per km for delivery. The region of the plane where it is cheaper to use the first company is -

(A) the inside of the circle $(x + 5.4)^2 + y^2 = 18.72$
(B) the outside of the circle $(x + 1.6)^2 + (y - 5.4)^2 = 18.72$
(C) the inside of the circle $(x - 1.6)^2 + (y + 5.4)^2 = 18.72$
(D) the outside of the circle $(x - 5.4)^2 + (y + 1.6)^2 = 18.72$

8. In a right triangle ABC. the in circle touches the hypotenuse AC at D. If AD = 10 and DC = 3, the inradius of ABC is -

(A) 5 (B) 4 (C) 3 (D) 2

9. The sides of a quadrilateral are all positive integers and three of them are 5, 10, 20. How many possible value are there for the fourth side ?

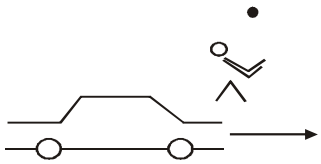
(A) 29 (B) 31 (C) 32 (D) 34

10. If the volume of a sphere increases by 72.8%, then its surface area increases by -

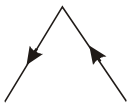
(A) 20% (B) 44% (C) 24.3% (D) 48.6%

PHYSICS

11. A boy standing on the foothpath tosses a ball straight up and catch it. The driver of a car passing by moving with uniform velocity sees this.



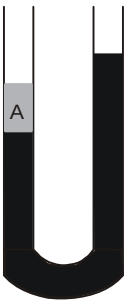
The trajectory of the ball as seen by the driver will be -

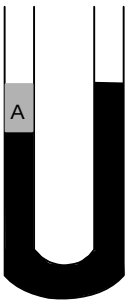
(A)  (B)  (C)  (D) 

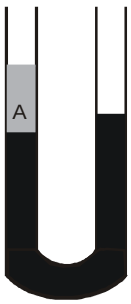
12. Consider two spherical planets of same average density. Planet 2 is 8 times as massive as planet 1. The ratio of the acceleration due to gravity on the second planet to that on the first is.

(A) 1 (B) 2 (C) 4 (D) 8

13. Two immiscible liquids, A and B are kept in a U-tube. If the density of liquid A is smaller than the density of liquid B, then the equilibrium situation is.

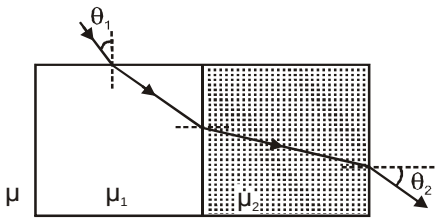
(A) 

(B) 

(C) 

(D) None of these

14. In !he figure below a ray of light travelling in a medium of refractive index μ passes through two different connected rectangular blocks of refractive indices μ_1 and μ_2 ($\mu_2 > \mu_1$).



The angle of incidence θ_1 is increased slightly. The angle θ_2

(A) increases.

(B) decreases.

(C) remains the same

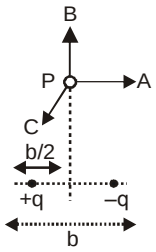
(D) increases or decreases depending on the value of (μ_1/μ_2).

15. Two charges of same magnitude move in two circles of radii $R_1 = R$ and $R_2 = 2R$ in a region of constant uniform magnetic field $\vec{B}_0$.

The work W_1 and W_2 done by the magnetic field in the Two cases, respectively are such that

(A) $W_1 = W_2 = 0$ (B) $W_1 > W_2$ (C) $W_1 = W_2 \neq 0$ (D) $W_1 < W_2$

16. Two charges +q and –q are placed at a distance b apart as shown in the figure below.



The electric field at a point P on the perpendicular bisector as shown as :

(A) along vector $\vec{A}$ (B) along vector $\vec{B}$ (C) along vector $\vec{C}$ (D) Zero

17. A block of mass M is at rest on a plane surface inclined at an angle θ to the horizontal The magnitude of force exerted by the plane on the block is :

(A) Mg cosθ (B) Mg sin θ (C) Mg tanθ (D) Mg

18. We are able to squeeze snow and make balls out of it because of -

(A) anomalous behaviour of water. (B) large latent heat of ice.

(C) large specific heat of water. (D) low melting point of ice.

19. Which of the following phenomena can be demonstrated by light. But not with sound waves in an air column?

(A) Reflection (B) Diffraction

(C) Refraction (D) Polarziation

20. The temperature of a metal coin is increased by 100°C and its diameter increases by 0.15%. Its area increases by nearly

(A) 0.15% (B) 0.60% (C) 0.30% (D) 0.0225%

CHEMISTRY

21. The element X which forms a stable product of the type XCl_4 is -

(A) Al (B) Na (C) Ca (D) Si

22. A mixture of NH_4Cl and NaCl can be separated by -

(A) filtration (B) Distillation (C) Sublimation (D) Decantation

23. The pair in which the first compound is ionic and the second compound is covalent, is -

(A) $Fe(OH)_2$,CH_3OH (B) CH_3OH, CH_3CH_2OH (C) $Fe(OH)_2$, $Cu(OH)_2$ (D) $Ca(OH)_2$, $Cu(OH)_2$

24. In the reaction $SO_2 + 2H_2S \longrightarrow 3S + 2H_2O$, the substance that is oxidized is -

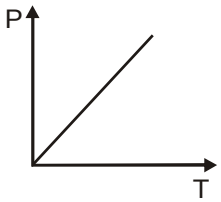
(A) SO_2 (B) H_2O (C) S (D) H_2S

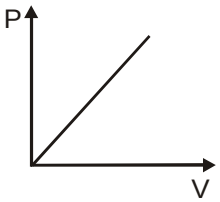
25. Sodium oxide dissolves in water to give sodium hydroxide which indicates its -

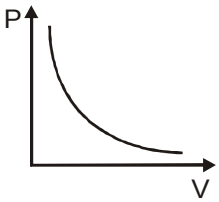
(A) acidic character (B) basic character

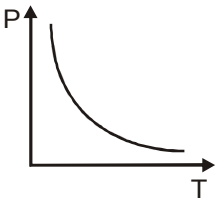
(C) amphoteric character (D) ionic character

26. For an ideal gas, Boyle's law is best described by -

(A) 

(B) 

(C) 

(D) 

27. The pH values of

(i) 0.1 M HCl aq (ii) 0.1 M KOH

(iii) tomato juice and (iv) pure water

follow the order -

(A) (i) < (iii) < (iv) < (ii) (B) (iii) < (i) < (iv) < (ii) (C) (i) < (ii) < (iii) < (iv) (D) (iv) < (iii) < (ii) < (i)

28. When calcium carbide is added to water, the gas that is evolved is -

(A) carbon dioxide (B) hydrogen (C) acetylene (D) methane

29. Atomic radii of alkali metals follow the order -

(A) Li > Na > K > Cs (B) K > Cs > Li > Na (C) Na > K > Cs > Li (D) Cs > K > Na > Li

30. The number of possible structural isomers of C_3H_4 is :

(A) 1 (B) 2 (C) 3 (D) 4

BIOLOGY

31. Which one of the following is the smallest in size ?

(A) Bacteria (B) Mitochondrion

(C) Mammalian cell (D) Virus

32. If birds are moved from 30°C to 10ºC, their body temperature :

(A) changes from 30ºC to 10°C (B) increases by 10ºC

(C) does not changes at all (D) decreases by 10ºC

33. Ascorbic acid is a/an.

(A) Strong inorganic acid (B) Hormone

(C) Vitamin (D) Enzyme

34. Bile salts :

(A) break down polypeptide chains (B) emulsify fats and solubilize them

(C) digest fats (D) help breakdown of polysaccharides

35. Dietary fibers are composed of :

(A) Cellulose (B) Amylase (C) Proteins (D) Unsaturated fats

36. 'On the origin of species , by means of Natural selection' was written by.

(A) Hugo de vires (B) Charles Darwin (C) Charles dickons (D) Alfred Russell wallace

37. Unlike humans, dogs cannot perspire to get rid to excess metabolic heat. They lose metabolic heat by:

(A) Panting (B) running in windy conditions

(C) taking a bath (D) rolling in the mud

38. Haemodialysis is a treatement option for patients with malfunctions of :

(A) Kidney (B) Heart (C) Liver (D) Lungs

39. An individual has O blood group if his/her blood sample.

(A) Clumps only when antiserum A is added

(B) Clumps only when antiserum B is added

(C) Clumps when both antiserum A and antiserum B are added

(D) Does not clump when either antiserum A or antiserum B is added

40. In warmer, weather, curds from milk forms faster because :

(A) bacteria diffuse better in warmer milk (B) the rate of bacterial multiplication increases

(C) lactogen is better dissolved (D) it is easier to separate protein from water

PRACTICE PAPER-3 (DESCRIPTIVE TYPE QUESTIONS)

PART-B (5 Mark)

MATHEMATICS

1. The radius of a cone is $\sqrt{2}$ times the height of the cone. A cube of maximum possible volume is cut from the same cone. What is the ratio of the volume of the cone to the volume of the cube ?

2. Three equal circles of unit radius toucher each other. Then find area of the circle circumscribing the three circle is (in sq. unit).

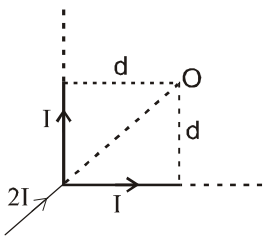
3. What will be the last digit of $2^{3^{4^5}} - 2^{3^{5^4}}$.

PHYSICS

4. A needle 10 cm long is placed along the axis of a convex lens of focal length 10 cm, such that the middle point of the needle is at a distance of 20 cm from the lens. Find the length of the image of the needle.

5. An iceberg is floating partially immersed in sea water. If the denssity of sea water is 1.03 g/cc and that of ice is 0.92 g/cc, find the fraction of the total volume of iceberg above the level of sea water.

6. An infinite wire bent in the form of L carries current I. Find the magnetic field at the point O



CHEMISTRY

7. The solubility product constant of Ag_2CrO_4 and AgBr are 1.1×10^{-12} and 5.0×10^{-13} respectively. Calculate the ratio of the molarities of their saturated solutions.

8. **(i)** The solution of salt (A) in dilute HCl gives a dirty yellow precipitate on passing H_2S gas. The precipitate dissolves in yellow ammonium sulphide.
(ii) The salt (A) gives chromyl chloride test.
(iii) (A) first forms a white precipitate with NaOH which dissolves in excess of NaOH forming a compound (B).
(iv) The alkaline solution of (B) when added to bismuth chloride gives a black precipitate (C).
(v) (A) reduces $HgCl_2$ in solution to a white precipitate (D) which changes to grey. Identify (A), (B), (C) and (D). Give reactions at steps (i) to (v).

9. Identify the gas (X) :
(i) (X) is a colourless with pungent smell.
(ii) (X) turns lime water milky
(iii) (X) turns acidified $K_2Cr_2O_7$ solution green.
(iv) (X) gives white turbidity when H_2S is passed through it aqueous solution.
(v) A white precipitate insoluble in conc. HNO_3 is formed when the aqueous solution of (X) in NaOH is treated with barium chloride and bromine water.

BIOLOGY

10. Answer the following questions :
(a) What is the name given to cytoplasmic connections in between two adjacent plant cells .What is its significance in phloem tissue ?

(b) What is phylogenetic classification ?

(c) "Bat and whales are mammals" comment on this statement.

(d) Define syndrome ?

(e) What are interferons ?

11. Answer the following question :

(i) Give one example each of insectivore and a sanguivore animal.

(ii) In which animal group first complete alimentary canal was developed ?

(iii) Name the digestive juice that contains no digestive enzyme ?

(iv) Name any two proteolytic enzymes ?

(v) Name the plant structure which helps in attaching the bryophytes to the substratum ?

12. Coin one word or two words equivalent for the following :

(i) Science that deals with the study of inheritance.

(ii) Alternative forms of some genes.

(iii) The person who coined the term chromosome.

(iv) The diagrammatic representation of karyotype.

(v) Name the term used for transfer of pollen grains with the help of insects.