Model Question Paper for SRMJEEE

B.Tech UG programs

Physics

1) **One watt hour contains how many Joules?**

a. 3.6×10^8

b. 3.6×10^2

c. 3.6×10^3

d. 1×10^{-3}

2) **The dimension of kinetic energy is same as that of _____**

a. force

b. pressure

c. work

d. momentum

3) **A food packet is dropped from a helicopter rising upwards at a constant speed of 2m/s. How far below the helicopter the packet will be after 2 seconds? Take g = 10m/s^2**

a. 16m

b. 20m

c. 24m

d. 40m

4) **The range of projectile when launched at an angle of 15^o with the horizontal is 1.5km. What is the range of the projectile when launched at an angle of 45^o to the horizontal?**

a. 1.5km

b. 3.0km

c. 6.0km

d. 0.75km

5) **Soap helps in cleaning clothes, because**

a. Chemicals of soap change

b. It increases the surface tension of the solution

c. It absorbs the dirt

d. It lowers the surface tension of the solution

6) Due to which property of water, tiny particles of camphor dance on the surface of water

a. Viscosity
b. Surface tension
c. Weight
d. Floating force

7) An unpolarized beam of intensity $2a^2$ passes through a polaroid. The intensity of emergent plane polarized light is _____

a. $a^2/2$
b. $4a^2$
c. $2a^2$
d. a^2

8) Unpolarized light of intensity 32 W/m^2 passes through three polarizers such that transmission axes of the first and second polarizer makes an angle 30° with each other and the transmission axis of the last polarizer is crossed with that of the first. The intensity of final emerging light will be _____

a. 3 W/m^2
b. 6 W/m^2
c. 8 W/m^2
d. 4 W/m^2

9) A neutron with velocity (V) strikes a stationary deuterium atom, its kinetic energy changes by a factor of_____

a. 15/16
b. 1/2
c. 2/1
d. 8/9

10) The mean half-Life of Radon 226 is 1600 years and that for Radon 222 is 3.8 days. Calculate the volume of radon gas that would be in equilibrium with 1gm of radium.[AT NTP 222gm of radon occupies a volume of 22400 cc]

a. 7.249×10^{-4} cc
b. 6.449×10^{-4} cc
c. 5.321×10^{-4} cc
d. 4.021×10^{-4} cc

Chemistry

1) The elevation in boiling point of the liquid is

a. dependent of both the nature and molality of the solute
b. independent of both the nature and molality of the solute
c. dependent of the nature of the solute and independent of molality of the solute
d. independent of the nature of the solute and dependent of molality of the solute

2) What is the term for the electrode where reduction reaction occurs?

a. anode
b. cathode
c. oxidizing agent
d. reducing agent

3) In an electrochemical cell, electrons travel in which direction?

a. From the anode to the cathode through the external circuit
b. From the anode to the cathode through the porous cup
c. From the cathode to the anode through the external circuit
d. From the cathode to the anode through the porous cup

4) Oil soluble dye is mixed with water -in-oil emulsion then:

a. dispersion medium is coloured
b. dispersion phase is coloured
c. dispersion medium is colourless
d. dispersion phase is colourless

5) Micelles are:

a. ideal solution
a. associated colloids
b. adsorbed surfaces
c. adsorbent solutes

6) The compound CH_3-CH_2-NH-CH_3 is an example of a

a. Primary amine
b. Secondary amine
c. Tertiary amine
d. Primary amide

7) The diazonium salts have the general formula

a. $RN_2+ X^-$

b. $RN_2+ X_2^-$

c. $RN+ X_2^-$

d. $RN+ X^-$

8) Which of the following most accurately describes phospholipids?

a. their empirical formula is (CH2O)n

b. they form cell membranes

c. they are made of amino acids

d. they are ionic

9) When an inhibitor resembles the substrate in its molecular structure and inhibits the activity of the enzyme, it is known as a

a. co-factor

b. prosthetic group

c. non-competitive inhibitor

d. competitive inhibitor

10) Elastic deformation in polymers is due to _____

a. Slight adjust of molecular chains

b. Slippage of molecular chains

c. Straightening of molecular chains

d. Severe of Covalent bonds

Mathematics

1) Let X = {a, a_2,….,a_6} and Y = {b_1, b_2, b_3}. The number of functions f from X to Y such that it is onto and there are exactly three elements x in X such that f(x) = b_1 is

a. 75

b. 90

c. 100

d. 120

2) If the graph of y = f(x) is symmetrical about lines x = 1 and x = 2, then which of the following is true?

a. f(x + 1) = f(x)

b. f(x + 3) = f(x)

c. f(x + 2) = f(x)

d. f(x + 4) = f(x)

3) For all complex numbers z of the form $z=1+2i\alpha$ where $\alpha \in R$, if $z^2 = x+iy$, then

a. $y^2+4x+2=0$

b. $y^2+2x-4=0$

c. $y^2+4x-4=0$

d. $y^2+6x-4=0$

4) If $|z-4+3i| + |z+ 11-5i|=17$, the locus of the point 'z' on the Argand plane is

a. an ellipse with foci 4-3i,5i-11

b. a line

c. a segment of the line through 4-3i and 5i-11

d. a line, except for a segment of the line

5) $\begin{vmatrix} 2xy & x^2 & y^2 \\ x^2 & y^2 & 2xy \\ y^2 & 2xy & x^2 \end{vmatrix}$ **is equal to**

a. $(x^2+y^2)^2$

a. $(x^2+y^2)^3$

b. $-(x^2+y^2)^3$

c. $-(x^3+y^3)^2$

6) If the system of equations x-ky-z=0, kx-y-z=0, x+y-z=0 has a non-zero solutions, then k is equal to

b. 0,1

a. 1,-1

b. -1,2

c. 2,-2

7) In how many ways can 4 red, 3 yellow and 2 green discs be arranged in a row if the discs of the same colour are indistinguishable?

a. 1260

b. 720

c. 360

d. 60

8) Let $f(x+2) =x^3+2x^2-3x+1$. then, $f'(3)$ equals

a. 5

b. 4

c. -6

d. 2

9) The equation of chord of contact of tangents from (5,3) to the hyperbola $4x^2 - 6y^2 = 24$ is

a. $9x + 10y + 12 = 0$
b. $10x + 9y - 12 = 0$
c. $9x - 10y + 12 = 0$
d. $10x - 9y - 12 = 0$

10) For (2n+1) observation $x_1, -x_1, x_2, -x_2, \ldots, x_n, -x_n$ and 0(zero) where x's are all distinct. Let S.D and M.D denote the standard and mean deviation respectively, then which of the following is always true?

a. S.D < M.D
b. S.D > M.D
c. S.D = M.D
d. S.D and M.D have no particular relationship.

Biology

1) The plant hormone which is basic in nature?

a. Auxin
b. Gibberellins
c. Cytokinin
d. Abscisic acid

2) Delay of senescence or Richmond Lang effect is a physiological effect of

a. IAA
b. CK
c. GA
d. C_2H_4

3) Shelf life of vegetables and cut flowers can be increased by commercial application of

a. Cytokinin
b. AMO1618
c. Cyclocel
d. Phosphon-D

4) In maize, hybrid vigour is exploited by

a. inducing mutations
b. bombarding the protoplast with DNA
c. crossing of two inbred parental lines
d. harvesting seeds from the most productive plants

5) In order to obtain virus-free plants through tissue culture the best method is

a. meristem culture
b. protoplast culture
c. embryo rescue
d. another culture

6) Which one of the following is being utilized as a source of biodiesel in the Indian countryside?

a. beetroot
b. sugarcane
c. Pongamia
d. Euphorbia

7) In maize, hybrid vigour is exploited by

a. crossing of two inbred parental lines
b. harvesting seeds from the most productive plants
c. inducing mutations
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8) 90% of blood from auricles enter into ventricles during

a. Auricular systole
b. Auricular diastole
c. Ventricular systole
d. Ventricular diastole

9) The QRS complex in ECG represents the electrical changes during

a. Depolarization of atria
b. Repolarization of atria
c. Depolarization of ventricles
d. Repolarization of ventricles

10) In large scale plant cell cultivation, which strategy is important for the removal of shear stress for operation stability

a. Immobilization
b. Induction
c. Elicitation
d. Inoculation

English

1) "Your parents were not anxious enough to have you learn. They preferred to put you to work on a farm or at the mills, so as to have a little more money. And I? I've been to blame also. Have I not often sent you to water my flowers instead of learning your lessons?"

This passagebest expresses the writer's:

a. feeling of anger
b. sense of guilt
c. state of confusion
d. feeling of fright

2) MR LAMB: I should say....to look at it.... I should say, you got burned in a fire.

DERRY: Not in a fire. I got acid all down that side of my face and it burned it all away. It ate my face up. It ate me up. And now it's like this and it won't ever be any different.

Derry's statement portrays a feeling of:

a. Exhaustion and helplessness
b. Anger and revenge
c. Self-pity and acceptance
d. Rejection and regret

3) "You must have patience, my little girl," said the father.

The indirect speech of this sentence is :

a. The father advised his daughter she should have patience
b. The father told his daughter that she must have patience
c. The father ordered his daughter to have patience
d. The father says that she should have patience

4) "Besides, the whole school seemed so strange and solemn. But the thing that surprised me most was to see, on the back benches that were always empty, the village people sitting quietly like ourselves."

`The underlined word means:

a. By the side of
b. In addition to that
c. On account of that
d. In spite of that

5) "It seemed a long way down. Those nine feet were more like ninety, and before I touched bottom my lungs were ready to burst. But when my feet hit bottom I summoned all my strength and made what I thought was a great spring upwards."

The passage above describes the author's experiment with:

a. Flying
b. Skating
c. Swimming
d. Sailing

Aptitude

1) The number M39048458N is divisible by 11 and 8, where M, N are single digit numbers, then what is the value of M, N?

a. 7, 8
b. 8, 6
c. 6, 4
d. 5, 4

2) What is the average of first 18 multiples of 6?

a. 18
b. 6
c. 72
d. 57

3) If the radius of a sphere is doubled, what is the percentage change in its volume?

a. 800% increase
b. 800% decrease
c. 700% increase
d. No change

4) The cost price of a pen is Rs.200 and its selling price is Rs.250. Find its profit %.

a. 20
b. 25
c. 50
d. 100

5) If a and b are the roots of the quadratic equation $x^2-2x+7=0$, then find a^2+b^2.

a. 7
b. 4
c. 2
d. Cannot be determined

6) How many tangents can be drawn to the circle from an external point?

a. 1
b. 2
c. 3
d. 4

7) If Atul finds that he is twelfth from the right in a line of boys and fourth from the left, how many boys should be added to the line such that there are 28 boys in the line?

a. 12
b. 13
c. 14
d. 20

8) 'A' walks 10 m in front and 10 m to the right. Then every time turning to his left he walks 5,10,15,20 m respectively. How far is he now from the starting point?

a. 5 m
b. 10 m
c. 15 m
d. 20 m

9) A is 50 years old and B is 40 years old. How long ago was the ratio of their ages 3:2?

a. 20 years
b. 30 years
c. 40 years
d. 25 years

10) If Sin A=3/4, then what is the value of Tan^2A-Sec^2A?

a. 0
b. 1
c. -1
d. 2