MODEL PAPERS
for
APTITUDE TEST

ADMISSION
to
F.Sc. (First Year) Pre-Engineering

PAKISTAN SWEET HOME CADET COLLEGE
APTITUDE TEST for ADMISSION to F.Sc. (First Year)
MODEL PAPER... MATHEMATICS

	Time Allowed	Max. Marks	
	45 minutes	25.0	

Q1. Insert appropriate mathematical term to complete the following statements. (1.0×4)

(i) Two linear factors of $x^2 - 5x - 6$ are _____.

(ii) If α, β are roots of $5x^2 - 3x - 9 = 0$, then product of roots is _____.

(iii) The mean proportional of $4m^2 n^4$ and p^6 is _____

(iv) A subset of $A \times A$ is called the _____ in A.

Q2. Each statement given below has been followed by multi options. In fact one of them is absolutely right. Encircle the correct one. (1.0×4)

(i) Point (1, –4) lies in quadrant _____

(a) I (b) II (c) III (d) IV

(ii) If $A \sqsubseteq B$, then $A \cap B$ = _____

(a) $\emptyset$ (b) U (c) B (d) A

(iii) $\sec\theta \cot\theta$ = _____

(a) $\sin\theta$ (b) $\frac{1}{\cos\theta}$ (c) $\frac{1}{\sin\theta}$ (d) $\frac{\sin\theta}{\cos\theta}$

(iv) The most frequent occurring observation in a data set is called _____

(a) mean (b) median (c) mode (d) range

Q3. Encircle 'T' for true or 'F' for false as the case may be. Provide the correct statement if it is deduced false. (1.0×4)

(i) The terminal side of angle 235° lies in 4th quadrant. **T / F**

_____

(ii) The spread or scatternes of observations in a data set is called central tendency. **T / F**

_____

(iii) In continued proportion $a : b = b : c$, c is said to be third proportional. **T / F**

_____

(iv) Roots of equation $4x^2 - 4x + 1 = 0$ are equal. **T / F**

_____

Q4. Solve the following sums. (2.0×5)

(i) Solve the equation $x^2 + 2x - 2 = 0$.

_____

_____

_____

_____

_____

_____

_____

(ii) Evaluate $(1 - 3\omega - 3\omega^2)^5$.

(iii) Find p, if 12, $3p - 6$, 27 are in continued proportion.

(iv) Prove that $(\tan\theta + \cot\theta)\tan\theta = \sec^2\theta$

(v) Find arithematic mean by direct method for following set of data 12, 14, 17, 20, 24, 29, 35, 45

Q5. The sum of the coordinate of a point is 9 and sum of their squares is 45. Find the coordinates of the point.

(3.0)

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MODEL PAPER... PHYSICS

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Q. 1 Insert appropriate scientific terms to complete the following statements. (1.0×4)

(i) Isotopes are atoms of same element with same_____

(ii) The relation between v, f and λ of a wave is _____

(iii) _____ is an example of a longitudinal wave.

(iv) The process by which electrons are emitted by a hot metal surface is called _____

Q.2 Each statement given below has been followed by multi options. In fact one of them is absolutely right. Encircle the correct one. (1.0×4)

(i) What is the direction of the magnetic field lines outside a bar magnet?

(a) From south pole to north pole (b) From north pole to south pole

(c) From side to side (d) There are no magnetic field lines

(ii) Two resistors of 20 ohm each are connected in parallel with a battery of 10V. The total current passing through the circuit is:

(a) 1A (b) 2A (c) 3A (d) 4A

(iii) The intensity of sound depends upon the _____ of a sound wave.

(a) Amplitude (b) Loudness (c) Both (a) and (b) (d) Pitch

(iv) To measure the potential difference voltmeter is connected in

(a) Series (b) Parallel (c) In any way (d) None

Q.3 Encircle 'T' for true or 'F' for false as the case may be. Provide the correct statement if it is deduced false. (1.0×4)

(i) The turn ratio of a transformer is 10. It means $N_s = 10\ N_p$. T / F

_____

(ii) The power of a convex lens is 5 dioptre. Its focal length will be 2cm. T / F

_____

(iii) A point charge of +2C is transferred from a point at potential 100V to a point at potential 50V. So the energy supplied by charge is 50 J. T / F

_____

(iv) Time period of a simple pendulum is independent of mass. T / F

_____

Q.4 Give short answers. (2.0 ×5)

(i) On what factors does the loudness of sound depends?

_____

_____

_____

_____

(ii) Define spherical mirror and give its types.

(iii) State coulomb's law and give its mathematical form.

(iv) Draw symbol and truth table of AND and OR gates.

(v) The half life of $_7N^{16}$ is 7.3s. A sample of this nuclide of nitrogen is observed for 29.2 s. Calculate the fraction of original radioactive isotope remaining after this time.

Q.5 Define and explain series combination of resistors. **(3.0)**

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MODEL PAPER... CHEMISTRY

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Q. 1 Insert appropriate scientific terms to complete the following statements. (1.0×4)

(i) In Solvay's process, _____ is recovered by heating ammonium chloride with slaked lime.

(ii) The chemical formula of washing soda is _____.

(iii) The ozone layer in stratosphere is beneficial for life on Earth as it absorbs _____ radiations of Sun.

(iv) In a Lewis acid-base reaction, a/an _____ bond is formed between the acid and the base.

Q.2 Each statement given below has been followed by multi options. In fact, one of them is absolutely right. Encircle the correct one. (1.0×4)

(i) Which of the following compounds is named incorrectly?

(A) CH_3CHO Acetaldehyde (B) $CH_3OCH_2CH_3$ Dimethyl ether

(C) CH_3COOCH_3 Methyl acetate (D) $CH_3CH_2CH_2OH$ n-propyl alcohol

(ii) In which of the following reactions, water acts as Bronsted-Lowry acid?

(A) $HCl + H_2O \rightleftharpoons H_3O^+ + Cl^-$ (B) $CH_3COOH + H_2O \rightleftharpoons H_3O^+ + CH_3COO^-$

(C) $H_2SO_4 + H_2O \rightleftharpoons H_3O^+ + HSO_4^-$ (D) $H_2O + NH_3 \rightleftharpoons NH_4^+ + OH^-$

(iii) The sugar that yields only glucose on hydrolysis is

(A) Lactose (B) Sucrose (C) Maltose (D) Fructose

(iv) Which reaction has different units of k_c from the others?

(A) $N_2O_{4(g)} \rightleftharpoons 2NO_{(g)}$ (B) $COCl_{2(g)} \rightleftharpoons CO_{(g)} + Cl_{2(g)}$

(C) $4NH_{3(g)} + 5O_{2(g)} \rightleftharpoons 4NO_{(g)} + 6H_2O_{(g)}$ (D) $2SO_{2(g)} + O_2(g) \rightleftharpoons 2SO_{3(g)}$

Q.3 Encircle 'T' for true or 'F' for false as the case may be. Provide the correct statement if it is deduced false. (1.0×4)

(i) The molecular formula of oxalic acid is $C_2H_2O_2$. T / F

_____

(ii) The temperature in mesosphere increases as altitude increases. T / F

_____

(iii) At equilibrium state, the concentrations of reactants and products become equal. T / F

_____

(iv) Concentration of the copper ore is carried out by froth flotation process. T / F

_____

Q.4 Give short answers. (2.0 ×5)

(i) How does addition of slaked lime remove temporary hardness of water?

_____

_____

_____

_____

_____

_____

_____

(ii) Describe the effects of acid rain.

(iii) Distinguish between homocyclic and heterocyclic compounds. Give examples.

(iv) What are monosaccharides? Give their characteristic properties.

(v) How can you prepare ethene from ethyl alcohol and ethyl chloride?

Q.5 Family/class of organic compounds is a series of similarly constituted compounds in which all members possess the same functional group and have similar chemical properties. (3.0)

(a) Which class of hydrocarbons can be represented by the following general formulae?

(i) C_nH_{2n+2} _____

(ii) C_nH_{2n} _____

(b) Give the name and molecular formula of the sixth member of each of the classes in (a).

(c) Give a chemical test by which you could distinguish the two hydrocarbons named in (b)

(d) To which class would these compounds belong?

(i) $CH_3 - \overset{\overset{O}{\|}}{C} - CH_3$ _____ (ii) $CH_3 - \overset{\overset{O}{\|}}{C} - H$ _____

(iii) $HO - \overset{\overset{O}{\|}}{C} - CH_3$ _____ (iv) $H - \overset{\overset{O}{\|}}{C} - CH_2 - CH_3$ _____

(v) $H_2C = CH - CH_3$ _____ (vi) $CH_3 - O - \overset{\overset{O}{\|}}{C} - CH_3$ _____

(e) Which of the compounds given in (d) belong to the same class?

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MODEL PAPER... ENGLISH

	Time Allowed	Max. Marks	
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Write meanings of the following words in Urdu or English: (1.0 × 3)

famous		ban		support	

Give Similar words (words having similar meanings): (0.5 × 3)

pleasure		respect		collect	

Give Opposite words (words having opposite meanings): (0.5 × 3)

decrease		remember		artificial	

Write the missing Form of Verb: (1.0 × 2)

throw			ride		

Choose the correct word to complete the sentence: (0.5 × 2)

Will the children _____ a museum tomorrow? (visit, visits, visited)	Every customer _____ paid the bill. (has, have, can)

Do as Directed: (1.0 × 3)

He drove the car carefully. (Change into Present Indefinite)	
The police caught the thief. (Change into Passive Voice)	
The gardener have sown a seeds. (Correct the Sentence)	

Make meaningful Sentences: (1.0 × 3)

repair	
worried	
act upon	

To clear the meanings of the given pair, use these words in your own sentence: (1.0 × 2)

accept	
except	

Translate into English: (1.0 × 3)

	میرا دوست جھوٹ نہیں بولتا ہے۔
	لوگ 8 بجے تک عید کی نماز پڑھ چکے تھے۔
	کیا تمام طلبا سبق یاد کریں گے؟

Write a five-sentenced Paragraph on the topic 'I work hard in studies because …… (1.0× 5)