Character, Courage and Commitment

ENTRANCE EXAM CLASS XI – 2024

MILITARY COLLEGE MURREE

(A)

PART-I

ENGLISH (50 MARKS)

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SECTION – A (Marks 15)

Q.1 Insert the correct option i.e. A / B / C / D in the empty box opposite to each part.

Each part carries one mark.

i. A rounded student is _____

    A. Good at academics   B. Good at co-curricular   C. normal   D. Both A & B

ii. Maria fell <u>over the cat</u>. (the underline part is a/an)

    A. Infinitive phrase   B. Gerund phrase

    C. Prepositional phrase   D. Adverb phrase

iii. Our job is to keep the <u>audience</u> happy. (The underlined word is a/an _____ noun)

    A. collective   B. concrete   C. abstract   D. material

iv. Ask <u>somebody</u> about the book. The underlined word is:

    A. Relative Pronoun   B. Indefinite Pronoun
    C. Personal Pronoun   D. Interrogative Pronoun

v. The tourists were <u>mesmerized</u> to see the beauty of K-2, and it was hard for them to take their eyes off it. Deduce the meaning of the underlined word:

    A. thrilled   B. shocked   C. spellbound   D. excited

vi. Being <u>imperious,</u> he expected everyone to obey him. The most appropriate word to replace the underlined word will be:

    A. peremptory   B. short-tempered   C. wise   D. abnormal

vii. <u>Marty, the class clown</u>, made every one laugh with his funny gestures. The underlined part of the sentence is used as a/an:

    A. Subject phase   B. Object phrase   C. Appositive phrase   D. Adjective phrase

viii. They <u>played</u> well and <u>won</u> the game. The underlined verbs are _____ and _____ respectively.

    A. finite, non finite   B. transitive, intransitive   C. regular, irregular   D. main, auxiliary

ix. Identify the phrase exemplifying the most appropriate order of adjectives.

    A. An expensive, new, imported car   B. A new, expensive, imported car

    C. An imported, expensive, new car   D. An imported, new, expensive car

x. An application _____ by Ali. **(to write- Present continuous)**

    A. Be written   B. Will being written   C. Is being written   D. Is written

xi. The phonetic symbol of the word 'vision' is:

    A. /vɪʒn/   B. /vizn/   C. /vɪzhən/   D. /wiʒn/

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xii. "He pronounced all the letters very **deliberately**. The underlined word is an adverb of:

A. Frequency   B. Degree   C. Time   D. Manner

xiii. Maria was <u>feeling blue</u> after her cat hit a car. The underlined part means:

A.   Maria did not like cars.   B.   Maria was sad.
C.   Maria was angry   D.   Maria was wearing blue dress

xiv. Will someone be here <u>to open the door</u>. (the underline part is a/an)

A.   Infinitive phrase   B.   Gerund phrase
C.   Prepositional phrase   D.   Adverb phrase

xv. <u>The man complained</u> that there was no bread. The Underlined part is:

A. Dependent clause   B. Independent clause   C. relative clause   D. none of them

SECTION – B (Marks 16)

Q.2: **Answer the following questions in about 30 to 40 words each. Each part carries equal marks.**   **(2 x 5 = 10)**

(i)   How are water resources under great stress?

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_____

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(ii)   Internet has brought people closer. How?

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(iii)   What was the situation when the Holy Prophet proclaimed on his deathbed?

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(iv) Why are the developing countries going to suffer more due to over population?

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(v) How is failure not a disgrace?

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Q.3: **Read the following stanza carefully and answer the questions given at the end:** **(6)**

The waves beside them danced, but they

Out-did the sparkling waves in glee;

A poet could not but be gay,

In such a jocund company!

I gazed – and gazed – but little thought

What wealth the show to me had brought:

Questions: **(3 x 2)**

(i) What is the rhyming scheme of the given stanza?

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(ii) Explain personification and where can it be found in the stanza?

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(iii)   Explain the stanza with reference to the context.

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Q.4:   **Translate the given sentences into English.**   **(1 x 5 = 5)**

(i)   وطن عزیز پیچیدہ حالات سے دوچار ہے۔

_____

(ii)   جھوٹ کے پاؤں نہیں ہوتے۔

_____

(iii)   کس نے دروازہ کھٹکھٹایا؟

_____

(iv)   اگر ہم امیر ہوتے تو دنیا کا سفر کرتے۔

_____

(v)   تو نقد نہ تیرا ادھار؟

_____

Q.5:   **Translate the given sentences into Urdu.**   **(1 x 5 = 5)**

a.   They will demonstrate safety precautions.

_____

b.   He has been studying since morning.

_____

c.   Good mind, good find.

_____

d.   Cats purr when they are content.

_____

e.   To owe is woe.

_____

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Q.6: Write a story in the given space based on the prompt /sketch /picture and give it an appropriate title. Use the given space only to write your story. (9)

Suitable Title: _____ (1)

Plot	2
Diction	1
Language	2
Characters	2

Three friends were playing in the isolated area, suddenly

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Lesson/Moral: _____ (1)

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PART-II

MATHEMATICS (50 MARKS)

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Q.7: Insert the correct option I.e. A / B / C / D In the empty box provided opposite to part. Each part carries one mark.

i.   Which is the smallest set?

    A.   Set of Rational numbers   B.   Set of Complex numbers

    C.   Set of Integers   D.   Set of Real numbers

ii.   Nature of the roots of the $7x^2 + 8x + 1 = 0$ are _____.

    A.   Real & Unequal   B.   Real & Equal

    C.   Imaginary & Unequal   D.   Imaginary & Equal

iii.   The continued proportion of 4, m and 9 gives $m =$ ____.

    A. ± 6 B. ± 5 C. -5 D. -6

iv.   The arcs opposite to incongruent central angles of a circle are always_____.

    A.   congruent   B.   incongruent   C.   parallel   D.   perpendicular

v.   The degree of the equation $x^2y^3 + x^2 - y^3 = 0$ is?

    A.   2   B.   3   C.   4   D.   5

vi.   The third proportional of x^2 and y^2 is ____

    A. $\dfrac{y^2}{x^2}$ B. x^2y^2 C. $\dfrac{y^4}{x^2}$ D. $\dfrac{y^2}{x^4}$

vii.   Partial fractions of $\dfrac{x+2}{(x+1)(x^2+2)^2}$ are of the form.

    A. $\dfrac{A}{x+1} + \dfrac{Bx+C}{(x^2+2)^2}$ B. $\dfrac{A}{x+1} + \dfrac{Bx+C}{x^2+2} + \dfrac{Dx+E}{(x^2+2)^2}$

    C. $\dfrac{A}{x+1} + \dfrac{B}{x^2+2} + \dfrac{C}{(x^2+2)^2}$ D. $1 + \dfrac{A}{x+1} + \dfrac{Bx+C}{x^2+2} + \dfrac{Dx+E}{(x^2+2)^2}$

viii. $\cot\theta \sec\theta =$ _____

    A. $\tan\theta \cos\theta$ B. $\sin\theta \cos\theta$ C. $\cot\theta$ D. $\csc\theta$

ix.   Newton's law of gravitation is an example of :

    A.   Variation   B. Direct variation   C. Inverse variation   D. Joint variation

x.   How many common tangents can be drawn for two disjoint circles?

    A. 1   B. 2   C. 3   D. 4

xi. $\sqrt{3x+7} = 2x + 3$ solution of the equation is

    A. $\dfrac{-1}{4}$ B. 1   C. -2   D. None

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xii. In improper fraction, degree of numerator is...............to the degree of denominator.

    A. Greater   B. Equal   C. Less   D. Both a and b

xiii. Polygon is ....sided closed figure.

    A. One   B. Two   C. Three   D. Many

xiv. The circle passing through the vertices of triangle ABC is known as :-

    A. Circumcircle   B.Escribe   C. inscribe   D. None

xv. The relation $\{(1,2),(2,3),(3,3),(3,4)\}$ is .... Function.

    A. Onto   B. Into   C. not a   D. one-one

<u>SECTION – B (MARKS : 15)</u>

Q 8. **Attempt all parts. All parts carry equal marks.**   **(5 x 3 = 15)**

i. If $\frac{a}{b} = \frac{c}{d} = \frac{e}{f}$ $(a,b,c,d,e,f \neq 0)$, then show that $\frac{ac+ce+ea}{bd+df+fb} = \left[\frac{ace}{bdf}\right]^{\frac{2}{3}}$

ii. The product of five less than three times a certain number and one less than four times the number is 7. Find the number.

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iii. Circumscribe a regular hexagon about a circle of radius 3cm.

iv. If α, β be the roots of $x^2 - 3x + 6 = 0$, form an equation whose roots are $\alpha + \beta, \frac{1}{\alpha} + \frac{1}{\beta}$.

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v. Verify that $\frac{1}{1-\cos\theta} + \frac{1}{1+\cos\theta} = 2\csc^2\theta$.

SECTION – C (MARKS : 20)

Note:- Attempt all questions.   **(4 x 5 = 20)**

Q.9 Resolve into partial fractions $\dfrac{x^4+3x^2+x+1}{(x+1)(x^2+1)^2}$

11

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Q.10: Use componendo - dividendo theorem to solve $\frac{(x+5)^3-(x-3)^3}{(x+5)^3+(x-3)^3} = \frac{13}{14}$.

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Q.11: Suppose that we are standing on a bridge 30 feet above the river watching a log floating towards us. If the angle with the horizontal to the front of the log is 16.7^0 and the angle with the horizontal to the back of the log is 14^0. Find the length of the log.

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Q.12: If two circles touch each other internally, then the point of contact lies on the line segment through their centers and distance between their centers is equal to the difference of their radii.

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PART- III

PHYSICS (50 MARKS)

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Q.13: Insert the correct option I.e. A / B / C / D In the empty box provided opposite each part. Each part carries one mark.

i. The half-life of a certain isotope is 1 day. What is the quantity of the isotope after 2 days?

    A.   1/2   B.   1/4   C.   1/8   D.   None of these

ii. What is the power rating of a lamp connected to a 12 V source when it carries 2.5 A:

    A.   4.8 W   B.   14.5 W   C.   30 W   D.   60 W

iii. The output of OR gate will be "0" when:

    A. A = 0, B = 0   B. A = 1, B = 1   C. A = 0, B = 1   D. A = 1, B = 0

iv. The mathematical equation for magnification of compound microscope is:

    A. $\frac{L}{f_e}(1+\frac{d}{f_o})$ B. $\frac{f_o}{L}(1+\frac{d}{f_o})$ C. $f_e(1+\frac{1}{f_o})$ D. $\frac{L}{f_o}(1+\frac{d}{f_e})$

v. If length of simple pendulum is doubled, its time period will

    A.   increase   B. become double   C. decrease   D. remain same

vi. If speed of sound is 320 ms⁻¹, the distance covered in a time of 1.5s will be:

    A. 331.5 m   B. 333.5 m   C. 480 m   D. 490 m

vii. In an electric circuit when electrons move from low to high potential, they will:

    A. loose Energy   B. gain energy   C. gain power   D. None

viii. The transformer works on the principle of:

    A. mutual induction B. D.C motor   C. A.C generator   D. self-induction

ix. The focal length f of a spherical mirror is related to its radius of curvature by:

    A. f = R/2   B. f= R   C. f =1.5 R   D. f = 2R

x. The correct formula for Joule's law is:
    A. $W = I^2Rt$ B. $W = IR^2t$ C. $W=IRt^2$ D. $W=I^2R^2t$

xi. A proton is about ___ times heavier than an electron.

    A. 1736   B. 1763   C. 1836   D. 1863

xii. Loudness of sound depends upon.
    A. Frequency   B.   period   C.   amplitude   D.   wavelength

xiii. Critical angle for water will be.
A. 18.8   B. 28.8   C. 38.8   D. 48.8

xiv. In Solenoid, line of force enters from.
A. North pole   B. South pole   C. North & south   D. None

xv. In burglar Alarm LDR acts as.
A. off switch   B. On switch   C. AND gate   D. OR gate

Section-B (Marks: 15)

Q.14: Attempt all parts. All Parts carry equal marks.   **(Marks 5×3=15)**

i. A person 1.7 m tall is standing 2.5 m in front of a camera. The camera uses a convex lens whose foal length is 0.05 m. Find the image distance (the distance between the lens and the film) and determine whether the image is real or virtual.

ii. Define the following terms applied to a lens: (a) principal axis (b) optical centre (iii) focal length.

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iii.   A certain flash-light can use a 10-ohm bulb or a 5-ohm bulb. Which bulb should be used to get the brighter light? Which bulb will discharge the battery first?

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iv.   Write down the factors that can enhance thermionic emission?

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v.   What is the displacement of an object in SHM when K.E. and P.E. are equal?

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Q.15: What is Cathode Ray Oscilloscope? Write down its main components and draw its diagram. (1+4)

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Q.16 A transformer, designed to convert the voltage from 240 V A.C mains to 12 V, has 4000 turns on the primary coil. How many turns should be on the secondary coil? If the transformer were 100% efficient, what current would flow through the primary coil when the current in the secondary coil was 0.4 A? (1+4)

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Q.17: Briefly explain nuclear Fusion Reaction. (5)

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Q.18: Define capacitor and capacitance. Derive a formula of equivalent capacitance for parallel combination. (1+4)

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PART-IV

CHEMISTRY (50 MARKS)

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Q. 19: Insert the correct option i.e. A / B / C / D in the empty box provided opposite each part. Each part carries one mark.

i. Which one of the following is not a pollutant?
   A. CFCs   B. SO_2 C. CO_2 D. CO   ☐

ii. **1g** of glucose provides energy equals to,
   A. 10.6 KJ   B. 14.6 KJ   C. 15.6 KJ   D. None   ☐

iii. Which one of the following is not a lewis Acid?
   A. $AlCl_3$ B. BF_3 C. Cu^{+2} D. Cl^{-1} ☐

iv. What is representation of a reversible reaction?

   A. Single arrow   B. Double arrows   C. Bar   D. None of these   ☐

v. What is general formula of alkynes?
   A. C_nH_{2n+2} B. C_nH_{2n} C. C_nH_{2n-2} D. None of these   ☐

vi. General formula for alcohols is _____.
   A. R-OH   B. R-O-R   C. R-COOH   D. $R-NH_2$ ☐

vii. In naming alkane stem tells about the _____.
   A. number of hydrogen atoms   B. number of oxygen atoms   ☐
   B. number of carbon atoms   C. number of bonds

viii. Which chemical is used for Antacid?

   A. NaOH   B. KOH   C. HCl   D. HNO_3 ☐

ix. Which gas has second the highest % in the air __?
   A. O_2 B. CO_2 C. N_2 D. O_3 ☐

x. Formula of soda ash is _____.
   A. Na_2CO_3 B. $NaHCO_3$ C. $Ca(OH)_2$ D. NH_4Cl ☐

xi. $WO_3 + 3H_2 \longrightarrow$?? + ??
   A. W/H_2 B. W/H_2O C. $W/3H_2O$ D. Tungsten   ☐

xii. The process in which solid waste is burnt up-to 1000°c temperature called _____.
   A. Boiling   B. Sublimation   C. Incineration   D. Burning   ☐

xiii. In the reaction of $CH_3Cl + 2[H] \xrightarrow{Zn/HCl}$?? + ?? the product is?   ☐
   A. CH_3Zn B. $CH_4 + HCl$ C. CH_2Cl_2 D. None

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xiv. Chemists add 2% gypsum in cement to increase its setting time, the formula of gypsum is?

A. $MgSO_4 \cdot H_2O$ B. $MgSO_4 \cdot 2H_2O$

C. $CaSO_4 \cdot 2H_2O$ D. Na_2CO_3

xv. Which of following has at least one hydrogen atom or two hydrogen atoms attached to carbonyl carbon atom?

A. Aldehydes   B. Ketones   C. Carboxylic acids   D. Ethers

Section - B (Marks 15)

Q. 20: Attempt all parts. All parts carry equal marks. (5x3=15)

i. What do you know about the term halogenations? How we can prepare chloroform by halogenations of alkanes?

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ii. Write structural formula of 1-Butyne and 2-Butyne.

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iii.   What is the function of DNA and RNA.

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iv.   What are the layers of atmosphere?

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v.   Define Mono-saccharides and why glucose cannot be hydrolyzed but sugar can be hydrolyzed? Justify.

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SECTION – C (Marks 20)

Note: Attempt All Questions. All questions carry equal marks.   **(4x5=20**

Q. 21: What do you know about the word petroleum and write a detail note on refining of petrole with its different fractions?

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Q. 22: Why global warming often is referred to as the greenhouse effect?

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Q. 23: Write a note on oligosaccharides.

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Q. 24: What do you know about the term Salt? Write down the 4 different ways formation of salts? (1+4)

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