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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)

MCA (Integrated)

SEM: VIII - THEORY EXAMINATION (2025 - 2026)

Subject: Cognitive Ability

Time: 3 Hours

Max. Marks: 100

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of **three Sections -A, B, & C**. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A

20

1. Attempt all parts:-

(1.1) The sum of the first four primes is (CO1,K2)

1

(a) 10

(b) 11

(c) 16

(d) 17

(1.2) 6897 is divisible by: (CO1,K2)

1

(a) 11 only

(b) 19 only

(c) both 11 and 19

(d) neither 11 nor 19

(1.3) 1, 4, 9, 16, 25, ____ (CO2,K1)

1

(a) 36

(b) 28

(c) 45

(d) 55

(1.4) SCD, TEF, UGH, ____, WKL (CO2,K1)

1

(a) CMN

(b) UJI

(c) VIJ

(d) IJT

(1.5) C@25, F#16, I@9, L#4, ...? (CO3,K1)

1

- (a) Q@1
(b) M@1
(c) O@1
(d) E#1
- (1.6) If 'du an xy' means 'water is life', 'xy an pi' means 'water is abundant', and 'rp hs du' means 'life and death', 'life' is coded as: (CO3,K1) 1
(a) du
(b) xy
(c) an
(d) pi
- (1.7) The number of degrees moved by the minute hand in 1 hour is: (CO4, K1) 1
(a) 180°
(b) 360°
(c) 720°
(d) 30°
- (1.8)year is a non-leap year. (CO4, K2) 1
(a) 2016
(b) 2000
(c) 1600
(d) 1800
- (1.9) A can complete a work in 8 days. work A does in 1 day. (CO5,K1) 1
(a) $1/6$
(b) $1/8$
(c) $1/10$
(d) $1/12$
- (1.10) A car travels 60 km in 2 hours. Then its speed: (CO5,K3) 1
(a) 20 km/h
(b) 30 km/h
(c) 40 km/h
(d) 50 km/h

2. Attempt all parts:-

- (2.1) Find the products: (i) 6.3204×100 (ii) $.069 \times 10000$. (CO1,K2) 2
- (2.2) Introducing a man, Sita said, 'He is the son of my mother's only daughter.' Determine the relation of the man to Sita. (CO2,K2) 2
- (2.3) Find 25% of 640. (CO3,K3) 2
- (2.4) Find the profit percent if cost price is ₹600 and selling price is ₹690. (CO4, K3) 2
- (2.5) The arithmetic mean of 15 numbers is 41.4. Find the sum of these numbers. (CO5, K3) 2

SECTION-B

30

Answer any one of the following:-

(3.1) Simplify: (CO1,K3) 6

$$\sqrt{\frac{0.009 \times 0.036 \times 0.016 \times 0.08}{0.002 \times 0.0008 \times 0.0002}}$$

- (3.2) A person walks 15 m East, then 8 m North, then 6 m West, and finally 12 m South. Find the distance and direction from the starting point. (CO1,K3) 6

Answer any one of the following:-

- (3.3) Find the unit digit of $2^{10} + 3^{15}$ (CO2,K3) 6
- (3.4) Find trailing zeros in $(500!)^3$ (CO2,K3) 6

Answer any one of the following:-

- (3.5) If $a:b = 3:5$ and $b:c = 4:7$, find $a:b:c$. (CO3,K3) 6
- (3.6) The price of a product increases by 20% and then decreases by 10%. Find the net percentage change. (CO3,K3) 6

Answer any one of the following:-

- (3.7) Shaloo sold a mobile phone at ₹1950 at a loss of 25%. Determine the price at which she should sell it to gain 30%. (CO4, K3) 6
- (3.8) An uneducated retailer marks all his goods at 50% above the cost price and thinking that he will still make 25% profit, offers a discount of 25% on the marked price. Find his actual profit on the sales. (CO4, K3) 6

Answer any one of the following:-

- (3.9) A mixture can be prepared by mixing two liquids A and B in the ratio 3 : 7 respectively. Calculate the total quantity of mixture that can be obtained when 6 litres of liquid A is used. (CO5, K3) 6
- (3.10) A alone can complete a piece of work of Rs. 300 in 6 days; but by engaging an assistant, the work is completed in 4 days. Find the share to be received by the assistant. (CO5, K3) 6

SECTION-C 50

4. Answer any one of the following:-

- (4.1) (a) Factorize: $x^3 + 6x^2 + 11x + 6$. 10
(b) Find the total number of prime factors in the expression $(4)^{11} \times (7)^5 \times (11)^2$. (CO1,K3)
- (4.2) Three bells ring at intervals of 12, 15 and 18 minutes. If they ring together at 6:00 a.m., Find the time at which three bells will ring together again (CO1,K3) 10

5. Answer any one of the following:-

- (5.1) Find highest power of 45 which can divide $80!$. (CO2,K3) 10
- (5.2) If $f(x) = x^3 + px^2 + qx + 1$ leaves remainder 4 when divided by $x-1$ and leaves remainder 2 when divided by $x+1$, find p and q . (CO2,K3) 10

6. Answer any one of the following:-

- (6.1) Alfred started a business investing Rs. 45000. After 3 months, Peter joined him with a capital of Rs. 60000. After another 6 months, Ronald joined them with a capital of Rs.90000. At the end of the year, they made a profit of Rs. 16500. Find each share. 10

(CO3,K3)

- (6.2) The ratio of ages of Tina and Rakesh is 9 : 10. Ten years ago it was 4 : 5. Find Rakesh's present age. (CO3,K3) 10

7. Answer any one of the following:-

- (7.1) A sum was put at simple interest at a certain rate for 2 years. Had it been put at 3% higher rate, it would have fetched Rs 300 more. Find the sum. (CO4, K3) 10
- (7.2) Determine the number of years required for a sum to become 9 times itself if it becomes 3 times in 3 years at compound interest. (CO4,K3) 10

8. Answer any one of the following:-

- (8.1) A pipe can fill a tank in 12 minutes and another pipe in 15 minutes, but a third pipe can empty it in 6 minutes. The first two pipes are kept open for 5 minutes in the beginning and then the third pipe is also opened. Determine the total time required to empty the cistern. (CO5, K3) 10
- (8.2) Ramesh can row a certain distance downstream in 6 hours and return the same distance in 9 hours. If the stream flows at 3 km/h, find the speed of Ramesh in still water. (CO5, K3) 10