INDIAN SCHOOL MUSCAT

TERM II EXAMINATION

APPLIED MATHEMATICS (241)

CLASS: XI MAX. MARKS: 40

DATE: 21- 02-2022 TIME ALLOWED: 2 HOURS

GENERAL INSTRUCTIONS:

1. This question paper contains three sections – A, B and C. Each part is compulsory.
2. Section - A has 6 short answer type (SA1) questions of 2 marks each.
3. Section – B has 4 short answer type (SA2) questions of 3 marks each.
4. Section - C has 4 long answer type questions (LA) of 4 marks each.
5. There is an internal choice in some of the questions.
6. Q14 is a case-based problem having 2 sub parts of 2 marks each.

SECTION A

1. A box contains 9 red, 5 blue and 6 green marbles. 3 marbles are drawn from the box at random. Find the probability that all will be blue. 2

2. Find the equation of the straight line passing through the point (-3, 4) and perpendicular to the line $3x + 2y - 12 = 0$. 2

3. Consider an experiment of rolling a die. If A be the event 'getting a prime number' and B be the event 'getting an odd number' then write the set representing the event 'B but not A' and find its probability. 2

4. A dealer in Mumbai sells a computer monitor to a customer in Mumbai at ₹8400. If the rate of GST is 18%, find CGST. 2

5. Calculate Simple Interest on ₹1200 @4% p.a. for 5 years. Also find out the amount. 2

6. (i) Find C_r^7 if $C_{2r}^{11} = C_{r+5}^{11}$ 2

OR

(ii) A committee of 5 has to be formed from 5 boys and 4 girls. In how many ways can this be done if the committee should have exactly 3 girls.

SECTION B

7. Evaluate : $\lim_{x \to 1} \frac{x^2-1}{2x^2-7x+5}$ 3

8. Classify annuities on the basis of time of payment. 3

9. (i) Find the centre and radius of the circle $x^2 + y^2 - 8x + 10y - 12 = 0$. 3

OR

(ii) Find the coordinates of the focus, equation of the directrix, equation of the axis and the length of latus rectum for the parabola $y^2 = -8x$.

10. (i) If y = $(x^3 + 3x)^2$, then find $\frac{dy}{dx}$. 3

OR

(ii) If f(x) = $\begin{cases} 3x - 8 & , x \leq 5 \\ 2k & , x > 5 \end{cases}$, find k so that f may be continuous at x = 5.

SECTION C

11. (i) Find the amount of an annuity of ₹800 payable at the end of each year for 3 years, if money is worth 8% per annum compounded annually. [Given $(1.08)^3 = 1.26$] 4

OR

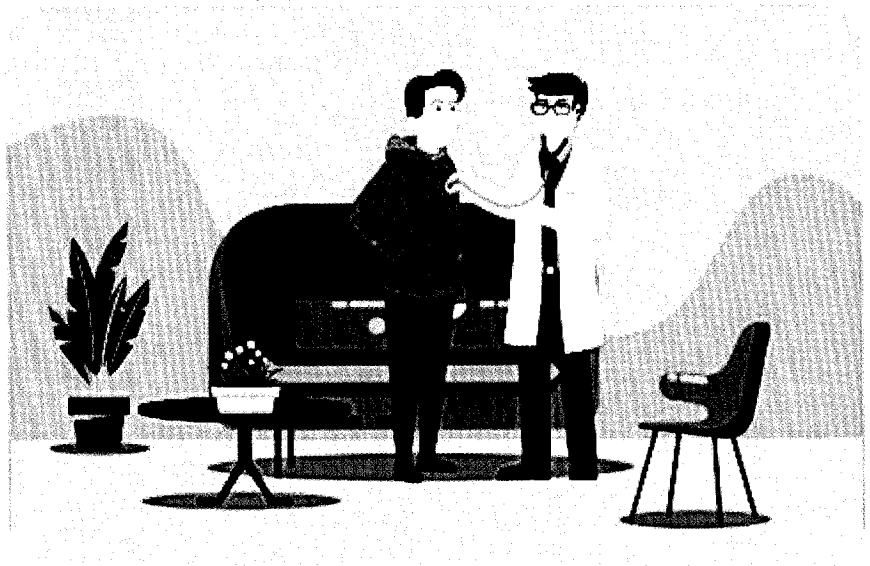
(ii) In financial year 2019-20, Mr. Chawla's annual salary was ₹ 9, 75,000 (exclusive of HRA). He earned ₹ 80000 as interest on savings bank account. He deposited ₹11000 per month in GPF. He donated ₹30000 in National Security Fund. Calculate the income tax paid by Mr. Chawla at the end of the financial year.

12. How many arrangements can be made with the letters of the word MATHEMATICS if 4
(i) M is at both extremes.
(ii) Vowels occur together.

13. On what sum will the compound interest for 2 years at 4% per annum be ₹ 5712? 4

CASE-BASED/DATA-BASED

14. A doctor is to visit a patient. From the past experience, it is known that the probabilities that he will come by cab, metro, bike or by other means of transport are respectively 0.3, 0.2, 0.1 and 0.4. The probabilities that he will be late are 0.25, 0.3, 0.35 and 0.1 if he comes by cab, metro, bike and other means of transport respectively. Based on the given information, answer the following questions.



(i) What is the probability that the doctor is late by any means? 2

(ii) When the doctor arrives late, what is the probability that he comes by metro? 2

End of the Question Paper