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| **FT/MAQP/1123/A 08-JUN-2023** | | |
| **FIRST TERM EXAMINATION 2023-24** | | |
| **SUBJECT: MATHEMATICS**  **GRADE: XI** | | **MAX MARKS: 80**  **TIME : 3 hrs** |
| ***General instructions***   * ***The question paper has 38 questions with five sections A, B, C, D, E. All questions are compulsory.*** * ***Section A has MCQ from question number 1 to 18 and assertion reasoning questions 19 and 20 carrying 1 mark each.*** * ***In Section B, questions 21 to 25 are very short answer type (VSA) carrying 2 marks each.*** * ***In Section C, questions 26 to 31 are short answer (SA) type carrying 3 marks each.*** * ***In Section D, questions 32 to 34 are long answer type (LA) carrying 4 marks each.*** * ***In Section E, questions 35 to 38 are long answer type carrying 5 marks each.*** | | |
| **SECTION A(1 Mark)** | | |
| 1. | The number of subsets of a set contianing *n* elements is   1. *n* (b) (c) (d) | |
| 2. | Let   1. [4, 5) (b) [4, 5] (c) (4, 5] (d) (4, 5) | |
| 3. | If , then the number of proper subsets of *A* is   1. 120 (b) 30 (c) 31 (d) 32 | |
| 4. | If *A* and *B* are two disjoint sets, then is equal to   1. (b)   (c) (d) ) | |
| 5. | If and , then is   1. (b) (c) (d) | |
| 6. | If , then   1. (b) (c) (d) *B* | |
| 7. | If R is a relation from a finite set A to a finite set B having n elements, then the number of relations from A to B is   1. (b) (c) (d) | |
| 8. | Let R be the relation on N defined by . The domain of R is   1. (b) (c) (d) | |
| 9. | If   1. (b) (c) (d) | |
| 10. | If , then the number of relations from A to B =   1. 6 (b) 36 (c) 63 (d) 64 | |
| 11. | The value of   1. 0 (b) 1 (c) – 2i (d) 2 | |
| 12. | The smallest positive integer n for which   1. 2 (b) 3 (c) 4 (d) 6 | |
| 13. | If   1. 1 (b) - 1 (c) 2 (d) -2 | |
| 14. | If   1. (b) (c) (d) | |
| 15. | A horse is tied to a post by a rope. If the hoirse moves along a circular path, always keping the ropes tight and describes *88m* when it traces 72 at the cntres, then the lentht of the rope is   1. 35m (b) 70m (c) 17.5m (d) 22m | |
| 16. | 25 when measured in radians is   1. (b) (c) (d) none of these | |
| 17. | 1. (b) (c) (d) | |
|  | ***Questions 19 and 20 are Assertion and Reason questions carrying 1 mark each.***   1. ***Both Assertion (A) and Reason (R)are true and Reason (R) is the correct explanation of Assertion (A)*** 2. ***Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A)*** 3. ***Assertion (A) is true and and Reason (R) is false.*** 4. ***Assertion (A) is false and Reason (R) is true.*** | |
| 19. | **Assertion(A):** The maximum value of is 2  **Reason(R):** The maximum value of is 1 and maximum value is 1 | |
| 20. | **Assertion (A):**  **Reason (R):** If then | |
| **SECTION B (2 marks)** | | |
| 21. | Prove that | |
| 22. | If is purely real, then find the value of | |
| 23. | Let A and B be two finite sets such that *n(A)=m* and *n(B)=n*. If the ratio of the cardinal numbers of power sets of A and B is 64:1 and *n(A) + n(B) = 32.* | |
| 24. | Find the domain and range of the relation R given by | |
| 25. | Find the linear relation between the components of the ordered pairs of the relation R where | |
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| **SECTION C (3 marks)** | | |
| 26. | Prove that | |
| 27. | If | |
| 28. | For a complex number z solve the equations: | |
| 29. | If | |
| 30. | In a beauty contest half the judges voted for Miss A, 2/3 voted for Miss B, 10 voted for both and 6 did not vote for either. Find how many judges were present in all. | |
| 31. | If a function *f* from *R* to *R* is defined by . Find the values of *a* and *b* given that (*a, 4*) and (*1, b*) belong to *f.* | |
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| **SECTION D (4 marks)** | | |
| 32. | Prove that | |
| 33. | Prove that | |
| 34. | In a university out of 100 students 15 offered Math only, 12 offered Statistics only, 8 offered only Physics; 40 Physics and Math; 20 Physics and Stats; 10 offered Math and Stats. 65 offered Physics. Find number of students who (i) took Math (ii) took Stats (iii) did not take any subject. | |
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| **SECTION E (5 marks)** | | |
| 35. | If | |
| 36. | If | |
| 37. | Out of 1020 boys in a school, 406 play cricket, 324 play hockey and 250 play football. 80 boys play cricket and hockey. 64 play hockey and football and 92 play football and cricket. While 30 play all the 3 games. Find  (i)Number of boys who play at least one of the games. (ii)Number of boys who play none of the games.  (iii)Number of boys playing football but not cricket. (iv)Number of boys playing only hockey.  (v)Number of boys playing cricket but not hockey. | |
| 38. | Find the domain and range of the following real functions: | |

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