POST GRADUATE COMMON ENTRANCE TEST-2017

DATE and TIME	COURSE	SUBJECT
01-07-2017 10.30 a.m. to 12.30 p.m.	Department of Post Graduate Studies and Research in Mathematics and Computer Science, Kuvempu University and Department of Studies in Computer Science, University of Mysore	MATHEMATICS AND COMPUTER SCIENCE

MAXIMUM MARKS	TOTAL DURATION	MAXIMUM TIME FOR ANSWERING
100	150 Minutes	120 Minutes

MENTION YOUR PGCET NO.	QUESTION BOOKLET DETAILS	
	VERSION CODE	SERIAL NUMBER
	A - 1	122115

DOs :
1. Check whether the PGCET No. has been entered and shaded in the respective circles on the OMR answer sheet.
2. Ensure whether the circles corresponding to course and the specific branch have been shaded on the OMR answer sheet.
3. This Question Booklet is issued to you by the invigilator after the **2ⁿᵈ Bell i.e., after 10.25 a.m.**
4. The Serial Number of this question booklet should be entered and the respective circles should also be shaded completely on the OMR answer sheet.
5. The Version Code of this question booklet should be entered on the OMR answer sheet and the respective circles should also be shaded completely on the OMR answer sheet.
6. Compulsorily sign at the bottom portion of the OMR answer sheet in the space provided.

DON'Ts :
1. **THE TIMING AND MARKS PRINTED ON THE OMR ANSWER SHEET SHOULD NOT BE DAMAGED / MUTILATED / SPOILED.**
2. The 3ʳᵈ **Bell rings at 10.30 a.m., till then;**
   - Do not remove the paper seal / polythene bag of this question booklet.
   - Do not look inside this question booklet.
   - Do not start answering on the OMR answer sheet.

IMPORTANT INSTRUCTIONS TO CANDIDATES

1. This question booklet contains 75 (items) questions and each question will have one statement and four answers. (Four different options / responses.)
2. After the 3ʳᵈ **Bell is rung at 10.30 a.m.,** remove the paper seal / polythene bag of this question booklet and check that this booklet does not have any unprinted or torn or missing pages or items etc., if so, get it replaced by a complete test booklet. Read each item and start answering on the OMR answer sheet.
3. During the subsequent 120 minutes:
   - Read each question (item) carefully.
   - Choose one correct answer from out of the four available responses (options / choices) given under each question / item. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose **only one response** for each item.
   - **Completely darken / shade the relevant circle with a BLUE OR BLACK INK BALL POINT PEN against the question number on the OMR answer sheet.**

Correct Method of shading the circle on the OMR answer sheet is as shown below :

Ⓐ ● Ⓒ Ⓓ

4. Use the space provided on each page of the question booklet for Rough Work. Do not use the OMR answer sheet for the same.
5. After the **last Bell is rung at 12.30 p.m.,** stop marking on the OMR answer sheet and affix your **left hand thumb impression** on the OMR answer sheet as per the instructions.
6. Handover the **OMR ANSWER SHEET** to the room invigilator as it is.
7. After separating the top sheet (KEA copy), the invigilator will return the bottom sheet replica (Candidate's copy) to you to carry home for self-evaluation.
8. Preserve the replica of the OMR answer sheet for a minimum period of **ONE year.**
9. Only **Non-programmable** calculators are allowed.

Marks Distribution		
PART-1	:	50 QUESTIONS CARRY ONE MARK EACH (1 TO 50)
PART-2	:	25 QUESTIONS CARRY TWO MARKS EACH (51 TO 75)

M/C-A1

MATHEMATICS AND COMPUTER SCIENCE
PART – A
Each question carries ONE mark. $\qquad$ **(50 × 1 = 50)**

1. If two lines are perpendicular then the product of their slopes is equal to

   (A) 1

   (B) –1

   (C) 0

   (D) 2

2. The equation of the straight line parallel to x-axis is given by

   (A) $\dfrac{x-a}{1} = \dfrac{y-b}{1} = \dfrac{z-c}{1}$

   (B) $\dfrac{x-a}{1} = \dfrac{y-b}{0} = \dfrac{z-c}{0}$

   (C) $\dfrac{x-a}{0} = \dfrac{y-b}{1} = \dfrac{z-c}{1}$

   (D) $\dfrac{x-a}{0} = \dfrac{y-b}{0} = \dfrac{z-c}{1}$

3. The length of major and minor axes of the Ellipse $\dfrac{x^2}{25} + \dfrac{y^2}{16} = 1$ is

   (A) 25, 16

   (B) 10, 8

   (C) 8, 10

   (D) 16, 25

4. What is the derivative of $f(x) = |x|$ at $x = 0$?

   (A) 1

   (B) –1

   (C) 0

   (D) does not exist

5. The value of the integral $\displaystyle\int_{-2}^{2} \dfrac{dx}{x^2}$ is

   (A) 0

   (B) 0.25

   (C) 1

   (D) ∞

6. Maxima and minima occurs

   (A) simultaneously

   (B) once

   (C) Rarely

   (D) Alternatively

Space For Rough Work

7. The value of $\lim_{x \to 0} (1 + x)^{1/x}$ is

(A) 0

(B) e

(C) 1

(D) $\dfrac{1}{e}$

8. The pedal equation of the curve $r^2 = a^2 \sin^2 \theta$ is

(A) $p = \dfrac{r^3}{a^2}$

(B) $p = \dfrac{r^2}{a}$

(C) $p = \dfrac{a^2}{r^3}$

(D) $p^2 = \dfrac{a}{r}$

9. $\displaystyle\int_{0}^{\pi/2} \cos^6 x \, dx$ is

(A) $\dfrac{5\pi}{32}$

(B) $\dfrac{5}{32}$

(C) $\dfrac{\pi}{32}$

(D) $\dfrac{5\pi}{16}$

10. Integrating factor for the differential equation $\cos^2 x \dfrac{dy}{dx} + y = \tan x.$

(A) $e^{\tan x}$

(B) $\cos 2x$

(C) $e^{-\tan x}$

(D) $\sin 2x$

11. $L[e^{2t} \sin t]$ is

(A) $\dfrac{s}{(s-2)^2 + 1}$

(B) $\dfrac{1}{(s-2)^2 + 1}$

(C) $\dfrac{1}{(s+2)^2 - 1}$

(D) $\dfrac{s}{(s-2)^2 - 1}$

12. If $u = \sin^{-1}\left(\dfrac{x^2 + y^2}{x + y}\right)$ then $x\dfrac{\partial u}{\partial x} + y\dfrac{\partial u}{\partial y}$ is

(A) cot u

(B) sin u

(C) tan u

(D) 0

Space For Rough Work

13. If the events A and B are independent then $P(A \cap B)$ is equal to

(A) $P(A) + P(B)$

(B) $P(A) - P(B)$

(C) $P(A) \cdot P(B)$

(D) $\dfrac{P(A)}{P(B)}$

14. Let A and B be two events with $P(A) = \dfrac{1}{2}$ $P(B) = \dfrac{1}{3}$ and $P(A \cap B) = \dfrac{1}{4}$ then $P(A/B)$ is

(A) $\dfrac{3}{4}$

(B) $\dfrac{4}{3}$

(C) $\dfrac{1}{4}$

(D) $-\dfrac{3}{4}$

15. The mode of the number 7, 7, 7, 9, 10, 11, 11, 11, 12 is

(A) 11

(B) 12

(C) 7

(D) 7 and 11

16. A man has 12 friends whom he wants to invite for lunch. In how many ways can he invite atleast 10 of them

(A) 66

(B) 140

(C) 153

(D) 79

17. The four roots of $x^4 = 1$ are

(A) $1, -1, i, -i$

(B) $1, 1, 1, 1$

(C) $1, 1, -1, -1$

(D) $i, i, -i, -i$

18. Let A = {1, 2, 3} then the power set of A has

(A) 3 elements

(B) 4 elements

(C) 6 elements

(D) 8 elements

Space For Rough Work

19. If $U = \{1, 2, 3, 4, 5, 6\}$, $A = \{2, 4, 6\}$ then A^c is

(A) $\{1, 3, 5\}$

(B) $\{2, 4, 6\}$

(C) $\{2, 4\}$

(D) $\{1, 5\}$

20. If p and q are two propositions then $\sim(p \lor q)$ is

(A) $p \land q$

(B) $p \lor q$

(C) $\sim p \land \sim q$

(D) $\sim p \lor \sim q$

21. If $a, b \in G$ is a group then $(ab)^{-1}$ is

(A) $a^{-1} b^{-1}$

(B) $b^{-1} a^{-1}$

(C) aa^{-1}

(D) bb^{-1}

22. The series $\sum_{n=1}^{\infty} \dfrac{1}{n^p}$ converges if

(A) $p > 0$

(B) $p < 1$

(C) $p > 1$

(D) $p < 0$

23. If $y = \tan^{-1} \sqrt{x}$ then $\dfrac{dy}{dx}$ is

(A) $\dfrac{1}{2\sqrt{x}(1+x)}$

(B) $\dfrac{1}{\sqrt{x}(1+\sqrt{x})}$

(C) $\dfrac{1}{x(1+\sqrt{x})}$

(D) $\dfrac{1}{2\sqrt{x}}$

24. From a pack of 52 cards, two cards are drawn random, what is the probability that both cards will be kings. if the first card is not replaced

(A) $\dfrac{1}{26}$

(B) $\dfrac{1}{52}$

(C) $\dfrac{1}{169}$

(D) $\dfrac{1}{221}$

Space For Rough Work

25. $\lim\limits_{x \to \pi/2} (\sin x)^{\tan x}$ is

(A) 1

(B) 0

(C) e

(D) $\pi/2$

26. UNIVAC is

(A) Universal Automatic Computer

(B) Unique Automatic Computer

(C) Universal Array Computer

(D) Unvalued Automatic Computer

27. Which of the following is identified as cloud ?

(A) Web applications

(B) C

(C) C⁺⁺

(D) Java

28. The length of the string "pgcet" is

(A) 6

(B) 8

(C) 5

(D) 10

29. The value of an automatic variable that is declared but not initialized will be

(A) 0

(B) −1

(C) 2

(D) unpredictable

30. The statement int i = 5i then $x = i$ ++; what is the value of x ?

(A) 4

(B) 5

(C) 6

(D) 7

Space For Rough Work

31. If $(a = 2)$

  printf("hello");

else

  printf("No");

what is the output ?

(A) No

(B) hello No

(C) hello

(D) No hello

32. Use of functions

(A) makes debugging task complex

(B) not enhance the logical clarity of the program

(C) makes the program complex

(D) helps to avoid repeating a set of statements many times.

33. Which of the following is not a low level feature of C ?

(A) Register class

(B) Bit fields

(C) Bit wise operations

(D) None

34. The statement a>>2; indicates :

(A) shifts two bits towards left

(B) shifts two bits towards right

(C) adds 2 to a

(D) bitwise adds 2

35. UNIX is an example for

(A) Command oriented OS

(B) GUI oriented OS

(C) A compiler

(D) Assembler

36. ROM is a

(A) Primary Memory

(B) Secondary Memory

(C) Random access Memory

(D) Flash Memory

37. ALU is nothing but

(A) all unit

(B) Arithmetic unit

(C) Arithmetic logic unit

(D) Algorithmetic unit

Space For Rough Work

38. Intel P4 is a

(A) RAM

(B) ROM

(C) USB

(D) Processor

39. E-mails can be accessed through

(A) Network

(B) LAN

(C) WAN

(D) Internet

40. Wchar is a valid datatype in C.

(A) Yes

(B) No

(C) May be

(D) Supports

41. Can you use social medias without using internet ?

(A) Yes

(B) True

(C) No

(D) 1

42. Word processor is an example for

(A) compiler

(B) interpreter

(C) application software

(D) system software

43. Can we count no. of words characters, spaces in a file using MS-word.

(A) Yes

(B) No

(C) Only words

(D) Only characters

Space For Rough Work

44. Extern is an example for

(A) Storage class

(B) Data type

(C) Function

(D) Arrays

45. In the expression –x, where ` ` is

(A) Subtraction operator

(B) Decrement operator

(C) Unary minus

(D) Binary minus

46. Size of(char) in bits

(A) 4

(B) 8

(C) 16

(D) 32

47. Pointer variable stores

(A) value

(B) address

(C) sum value

(D) decremented value

48. ++x; where ++ is

(A) Pre decrementer

(B) Pre incrementer

(C) Post incrementer

(D) Post decrementer

49. Read only memory contents are

(A) Volatile

(B) Static

(C) Non-volatile

(D) Programmable

50. The loop for (; ;); is valid.

(A) No

(B) Error

(C) Invalid Statement

(D) Yes-valid statement

Space For Rough Work

A-1   10   M/C

51. L[t cos at] is

(A) $\dfrac{s}{(s^2+a^2)^2}$

(B) $\dfrac{s^2-a^2}{(s^2+a^2)^2}$

(C) $\dfrac{a^2}{(s^2-a^2)^2}$

(D) $\dfrac{s^2+a^2}{(s^2+a^2)^2}$

52. The solution of

$(D^3 + D^2 + 4D + 4)\qquad y = 0$ is

(A) $y = c_1 e^{-x} + c_2 \cos 2x + c_3 \sin 2x$

(B) $y = c_1 e^{x} + c_2 \cos 2x + c_3 \sin 2x$

(C) $y = (c_1 + c_2 x + c_3 x^2)\, e^{-x}$

(D) $y = c_1 e^{-x} + c_2 e^{-2x} + c_3 e^{2x}$

53. $\displaystyle\int_0^1 x^4(1-x^2)^{3/2}\,dx$ is

(A) $\dfrac{\pi}{256}$

(B) $\dfrac{3}{256}$

(C) $\dfrac{3\pi}{256}$

(D) $\dfrac{1}{256}$

54. $\displaystyle\sum\left(1+\dfrac{1}{n}\right)^{-n^2}$ is

(A) Converges

(B) Oscillatory

(C) Divergent

(D) Conditionally Convergent

55. $L^{-1}\left[\dfrac{1}{(s+a)^2}\right]$ is

(A) e^{at}

(B) $t\,e^{at}$

(C) $t\,e^{at}$

(D) e^{at}

56. If $P(A) = \dfrac{1}{4}$, $P(B) = \dfrac{1}{3}$,

$P(A \cup B) = \dfrac{1}{2}$ then $P(A/A^1)$ is

(A) $\dfrac{1}{2}$

(B) $\dfrac{1}{3}$

(C) $\dfrac{1}{5}$

(D) $\dfrac{1}{4}$

57. Find the probability of drawing an ace or spade or both from a deck of cards

(A) $\dfrac{1}{13}$

(B) $\dfrac{17}{52}$

(C) $\dfrac{13}{52}$

(D) $\dfrac{4}{13}$

58. $\underset{x \to 0}{\mathrm{Lt}}\left(\dfrac{a^x + b^x + c^x + d^x}{4}\right)^{1/x}$ is

(A) $(abcd)^{1/4}$

(B) $abcd$

(C) $\log(abcd)$

(D) 1

59. The points $A(-4, 9, 6)$; $B(-1, 6, 6)$; $C(0, 7, 10)$ form a right angled isosceles triangle, the direction cosines of AB are

(A) $\sqrt{2}, -\sqrt{2}, 0$

(B) $\dfrac{1}{\sqrt{2}}, \dfrac{-1}{\sqrt{2}}, 0$

(C) $\sqrt{2}, -\sqrt{2}, \sqrt{2}$

(D) $0, \sqrt{2}, -\sqrt{2}$

60. The angle between two curves $r^n = a^n \cos n\theta$, $r^n = b^n \sin n\theta$ is

(A) 0

(B) $\dfrac{\pi}{4}$

(C) $\dfrac{\pi}{2}$

(D) π

Space For Rough Work

61. The particular integral of $(D^2 + a^2) y = \sin ax$ is

(A) $-\dfrac{x}{2a}\cos ax$

(B) $\dfrac{x}{2a}\cos ax$

(C) $-\dfrac{ax}{2}\cos ax$

(D) $\dfrac{ax}{2}\cos ax$

62. In a frequency distribution, mid-value of a class is 15 and class interval is 4. The lower limit of the class is

(A) 14

(B) 13

(C) 12

(D) 10

63. Consider the function

find(int x, int y)

{

    return((x<y)?0 :(x–y));

}

let a, b be two non-negative integers. The call find (a, find (a, b)) can be used to find the

(A) maximum of a, b

(B) positive difference of a, b

(C) sum of a, b

(D) minimum of a, b

64. The following program fragment

for(i=1; i<5; ++i)

    if(i==3)

        continue;

    else

        printf("%d", i);

result in printing of

(A) 1 2 4 5

(B) 1 2 4

(C) 2 4 5

(D) 1 2 3 4

65. for (i=3; i<15; i+=3)

{

    printf("%d", i);

    ++i;

}

will result in

(A) 3 6 9 12

(B) 3 6 9 12 15

(C) 3 7 11

(D) 3 7 11 15

Space For Rough Work

66. Consider the array definition int num[10] = {3, 3, 3};

(A) num[9] is the last element of the array num

(B) the value of num[8] is 3

(C) the value of num[3] is 3

(D) The value of num [4] is 3

67. if a=5, b=5 then

x=++a; y=b++; then values of a, b, x and y are

(A) 6 6 6 5

(B) 6 6 6 6

(C) 6 6 5 6

(D) 5 6 5 6

68. Forward declaration is absolutely necessary

(A) if a function returns a non-integer quantity.

(B) if the function call precedes its definition.

(C) if the function call precedes its definition and the function returns a non-integer quantity.

(D) in an expression.

69. The purpose of the following program code is for

b = s + b;

s = b – s;

b = b – s;

where s, b are two integers is to

(A) transfer the contents of s to b.

(B) transfer the contents of b to s.

(C) exchange the contents of s and b.

(D) negate the contents of s and b.

70. The statement

printf("%d", 25++);

prints:

(A) error

(B) garbage

(C) 25

(D) 26

Space For Rough Work

71. Consider the following program code :

int p=5, *ptr=&p;

printf("%d\t %d", p'*p+r);

the output will be

(A) an error

(B) 5 and address of P

(C) 5 and garbage value

(D) 5 and 5

72. Any C program must contain

(A) at least one function

(B) one variable

(C) an array

(D) constant

73. for(i=1; i<=2; i++)

    for(j=1; j<=1; j++)

    printf("%d\t%d", i' j);

(A) 1 1 1 2

(B) 1 2 1 1

(C) 1 1 1 1

(D) 1 1 2 1

74. int i=5; *j=&i;

    i++;

printf("i=%d\t%d", i, *j);

(A) 5 5

(B) 5 6

(C) 6 5

(D) 6 6

75. in arr[ ] = {2, 5, 6, 7}; then what is the value of arr[3];

(A) 2

(B) 5

(C) 6

(D) 7

Space For Rough Work

Space For Rough Work