(20518)

BCA-IV Sem.

Roll No. ....

18016

B. C. A. Examination, May 2018

Computer Graphics and Multimedia Application

(BCA-401)

(New)

Time : Three Hours] [*Maximum Marks :-75*

Note : Attempt questions from all Sections as per instructions.

Section-A

(Very Short Answer Questions)

Attempt all the *five* questions. Each question carries 3 marks. Very short answer is required not exceeding 75 words. 3×5=15

1. What is GUI ? Explain.

2. What is Multimedia ?

3. Write the uses of Computer Graphics ?

4. Define 'Shear' transformation.

5. What is Refresh Rate ?

Section-B

(Short Answer Questions)

Attempt any *two* questions out of the following three questions. Each question carries 7½ marks. Short answer is required not exceeding 200 words. 7½×2=15

6. Describe about the most commonly used colour models used in Computer Graphics.

7. Describe any method for visible surface detection.

8. What is bit plane ? How bit planes are used to get different colours ?

18016

Section-C

(Detailed Answer Questions)

Attempt any *three* questions out of the following five questions. Each question carries 15 marks. Answer is required in detail.   15×3=45

9.   Generate an origin centered circle with radius-2 with eight unique points on the circle.

10.   Rotate a triangle [(4, 6), (2, 4), (6, 2)] about the vertex (4, 6) by 180° clockwise and find the new vertices.

11.   Differentiate between the terms multimedia system and multimedia application, with example.

12.   A triangle *ABC* is *A* (0, 0), *B*(4, 0) and *C*(0, 4). Find the shearing transformation with $a = 2$ and $b = 3$.

13.   Write short notes on any three of the following :

   (a)   Projection

   (b)   Colour frame buffer

   (c)   2-buffer method

   (d)   DDA.

(20518)

Roll No. ....

BCA-IV Sem.

18017

B. C. A. Examination, May 2018

Operating System

(BCA-402)

(New)

Time : Three Hours]   [Maximum Marks : 75

Note : Attempt questions from all Sections as per instructions.

Section-A

(Very Short Answer Questions)

Attempt all the *five* questions. Each question carries 3 marks.   3×5=15

1. What is an operating system ? Discuss the various services of the OS.

2. Difference between time sharing system and real time system.

3. Difference between physical address and logical address.

4. Explain the demand paging and cache memory.

5. Explain the various attributes of a file.

Section-B

(Short Answer Questions)

Attempt any *two* questions out of the following three questions. Each question carries 7½ marks. 7½×2=15

6. Describe the critical section problem with suitable example.

7. Write the five UNIX and DOS commands with cross reference and function.

8. Explain, how memory can dynamically allocated using first fit, best fit and worst fit strategies.

Section-C

(Detailed Answer Questions)

Attempt any *three* questions out of the following five questions. Each question carries 15 marks.   15×3=45

18017

9. (a) What is page frame and page fault ?

    (b) Solve :

    7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1
    using FIFO and LRU algorithm and calculate
    the page fault, page from = 3.

10. (a) Explain the performance criteria for scheduling
    algorithms.

    (b) Consider the following process :

Process	Arrival Time	Burst Time (ms)
P_1	0	8
P_2	1	4
P_3	2	9
P_4	3	5

    Calculate the average Wt. time and TAT by SJF
    preemptive and SJF non-preemptive
    scheduling.

11. Define the following :

    (i) Fragmentation

    (ii) Paging

    (iii) Process state

    (iv) Segmentation

    (v) Memory management system.

18017

12. What is deadlock ? Explain four necessary conditions
    for deadlock to occur with suitable example. Describe
    the different methods for prevention and avoidance of
    deadlocks.

13. Explain the linked allocation method for file. List the
    merits and drawbacks of this method. How does an
    indexed allocation solve the problems of linked
    allocation scheme ?

(20518)

Roll No. ....

BCA- IV Sem.

18019

B. C. A. Examination, May 2018

Optimization Techniques

(BCA-404)

(New)

Time : Three Hours] [Maximum Marks : 75

Section-A

(Very Short Answer Questions)

Attempt all the *five* questions. Each question carries 3 marks. Very short answer is required. 3×5=15

1. Define a linear programming problem.

2. Define money value and present value.

3. Define busy period, idle period and mean arrival rate.

4. Explain travelling salesman problem.

5. Describe holding cost, shortage cost and ordering cost.

Section-B

(Short Answer Questions)

Attempt any *two* questions out of the following three questions. Each question carries 7½ marks. Short answer is required. 7½×2=15

6. Solve the following assignment problem :

Subordinates

		I	II	III	IV
	A	8	26	17	11
Tasks	B	13	28	4	26
	C	38	19	18	15
	D	19	26	24	10

7. The cost of an item is 3,000. The salvage value and running cost are given below. Find the most economical replacement age of the item :

Year	Running cost	Salvage cost
1	600	2000
2	700	1333
3	800	1000
4	900	750
5	1000	500
6	1200	300
7	1500	300

18019

8. Find the sequence that minimizes the total elapsed time required to complete the following tasks on two machine :

	A	B	C	D	E	F	G	H	I
Macine - I	2	5	4	9	6	8	7	5	4
Machine - II	6	8	7	4	3	9	3	8	11

Section-C

(Detailed Answer Questions)

Attempt any *three* questions out of the following five questions. Each question carries 15 marks. Answer is required in detail. $15 \times 3 = 45$

9. Solve the following L. P. P. :

Maximize $z = 5x_1 + 3x_2$

s. t. $3x_1 + 5x_2 \le 15$

$5x_1 + 2x_2 \le 10$

$x_1, \ x_2 \ge 0$

10. Solve the following transportation problem :

To

From		1	2	3	Supply
	1	2	7	4	5
	2	3	3	1	8
	3	5	4	7	7
	4	1	6	2	14
Demand		7	9	18	34

11. The cost pattern for two machines A and B when money value is not considered is given as follows :

Year	Cost at the beginninng of year in Rs.	
	Machine A	Machine B
1	900	1400
2	600	100
3	700	700
Total	2200	2200

Find the cost pattern for each machine when money worth is 10% per year and hence find which machine is less costly.

12. We have five jobs, each of which must go through the machine A, B and C in the order ABC :

Processing Times in hours

Job No. i	1	2	3	4	5
Machine A(A_i)	5	7	6	9	5
Machine B(B_i)	2	1	4	5	3
Machine C(C_i)	3	7	5	6	7

Determine a sequence for the jobs that will minimize the total elapsed time.

13. Customers arrive at a sales counter manned by a single person according to a Poisson process with a mean rate at 20 per hour. The time required to serve a customer has an expontential distribution with a mean of 100 seconds. Find the average waiting time of a customer and queue length.

BCA- IV Sem.

18020

B. C. A. Examination, May 2018

MATHEMATICS-III

(BCA-406)

(New)

Time : Three Hours]   *[Maximum Marks : 75*

Note : Attempt questions from all Sections as per instructions.

Section-A

(Very Short Answer Questions)

Attempt all the *five* questions. Each question carries 3 marks. Very short answer is required.

3×5=15

1. Express $\dfrac{2+3i}{4+5i}$ in the form of $x+iy$.   3

2. If $x+iy = \dfrac{3}{2+\cos 0 + i\sin 0}$, prove that :   3

$$(x-1)(x-3)+y^2 = 0.$$

3. Test for convergence $\displaystyle\sum_{n=1}^{\infty}\sin\dfrac{1}{n}$.   3

4. If $\vec{r} = a\hat{i} + b\hat{j} + c\hat{k}$, find the directional derivative of $\dfrac{1}{r}$ in the direction of $\vec{r}$.   3

5. For any scalar function $\phi(x, y, z)$, prove that curl grad $\phi = 0$.   3

Section-B

(Short Answer Questions)

Attempt any *two* questions out of the following three questions. Each question carries 7½ marks. Short answer is required.   7½×2=15

6. Solve $(x+1)\dfrac{dy}{dx} = x(y^2 + 1)$.   7½

18020

7. If $\tan^{-1} a + \tan^{-1} b + \tan^{-1} c = \pi$, then prove that
   $a + b + c = abc$.   7½

8. Solve $\dfrac{dy}{dx} = \dfrac{1+y^2}{\tan^{-1} y - x}$.   7½

Section-C

(Detailed Answer Questions)

Attempt any *three* questions out of the following five questions. Each question carries 15 marks. Answer is required in detail.   15×3=45

9. (a) Test the convergence of the series :   7½

$$\frac{1}{2} + \frac{2}{3}x + \left(\frac{3}{4}\right)^2 x^2 + \left(\frac{4}{5}\right)^3 x^3 + \dots$$

(b) Test for convergence the series whose nth

term is $\dfrac{r^n}{n^n}$, $r > 0$.   7½

10. (a) Show that the vector field defined by :

$$\vec{F} = 2xyz^3\hat{i} + x^2z^3\hat{j} + 3x^2yz^2\hat{k}$$

is irrotational. Find the scalar potential u such that $\vec{F} = \operatorname{grad} u = \nabla u$.   7½

(b) If $\vec{E}$ and $\vec{H}$ are irrotational, prove that $\vec{E} \times \vec{H}$ is solenoidal. https://www.ccsustudy.com   7½

18020

11. (a) Test for the convergence of the series

$$\sum_{n=2}^{\infty} \frac{1}{(\log n)^n}.$$ 7½

(b) Find the directional derivative of $f(x, y, z) = x^2yz + 4xz^2$ at the point $(1, -2, -1)$ in the direction of the vector $2\hat{i} - \hat{j} - 2\hat{k}$.   7½

12. (a) Solve $y \sec^2 x + (y+7) \tan x \dfrac{dy}{dx} = 0$.   7½

(b) Solve $(1+x^2)\dfrac{dy}{dx} + 2xy = \cos x$.   7½

13. (a) Find the directional derivative of $f(x, y, z) = x^2y^2z^2$ at the point $(1, 1, -1)$ in the direction of the tangent to the curve $x = e^t$, $y = 2\sin t$, $z = t - \cos t$, at $t = 0$.   7½

(b) Solve $x(e^y + 4)dx + e^{x+y}dy = 0$.   7½

(20518)

Roll No. ....

BCA-IV Sem.

18018

B. C. A. Examination, May 2018

Software Engineering

(BCA-403)

(New)

Time : Three Hours] [*Maximum Marks : 75*

Note : Attempt questions from all Sections as per instructions.

Section-A

(Very Short Answer Questions)

Answer all the *five* questions. Each question carries 3 marks. Very short answer is required. 3×5=15

1. Define Software Engineering.

2. What are the various types of software maintenance ?

3. What is software process of software development life cycle (SDLC) ?

4. How do software products age ?

5. What is software requirement specification ?

Section-B

(Short Answer Questions)

Answer any *two* questions out of the following three questions. Each question carries 7½ marks. Short answer is required. 7½×2=15

6. What are the components of gathering the requirements ?

7. Discuss the importance of Agile Process.

8. Discuss the components of object-oriented design.

18018

Section-C

(Detailed Answer Questions)

Answer any *three* questions out of the following five questions. Each question carries 15 marks. Answer is required in detail.   15×3=45

9.   Explain software process.

10.   Explain the factors considering while deciding the maintenance cost.

11.   What is software re-engineering ? Explain its process.

12.   What are the CASE tools and their usage in software engineering ? Discuss.

13.   Discuss the maintenance activities in detail.