



IV Semester M.C.A. Examination, Oct./Nov. 2020

(CBCS)

COMPUTER SCIENCE

MCA 401 T : Advanced Java Programming

Time : 3 Hours

Max. Marks : 70

Instruction : Answer **any five** from Part – **A** and **any four** from Part – **B**.

PART – A

Answer **any five** questions. **Each** question carries **six** marks : **(5×6=30)**

1. What is polymorphism in java ? Explain with an example.
2. What is Annotation ? Explain its different types with an example.
3. How the exceptions are handled in java ?
4. What is an applet ? Explain the life cycle of an applet.
5. What is event handling ? Explain with an example.
6. Differentiate between method overloading and method overriding.
7. How does Java handle garbage collection ?
8. What is synchronization ? Explain it with an example.

PART – B

Answer **any four** questions. **Each** question carries **10** marks : **(4×10=40)**

1. A) Define Interface. Explain the implementation of interface in Java. **(5+5)**
B) Explain Servlet life cycle.



2. A) What is Design pattern ? (2+8)
B) Explain proxy pattern in detail.
3. Explain MVC model in detail with a neat diagram. 10
4. A) What are Web services ? Explain SOAP and RESTFUL web services. (5+5)
B) What are the advantages of packages explain with an example ?
5. Write a JSP Program using expression, scriptlet, comments and declaration. 10
6. Explain the flow of working during operation in Hibernate Framework. 10

PART – B

Answer any four questions. Each question carries 10 marks. (4x10=40)

7. (A) Define Interface. Explain the implementation of interface in Java. (5+5)



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**IV Semester M.C.A. Examination, Oct./Nov. 2020
(CBCS Scheme)**

COMPUTER SCIENCE

MCA 403 T : Advanced Software Engineering

Time : 3 Hours

Max. Marks : 70

Instructions : 1) Part – A : Answer **any five** questions.

2) Part – B : Answer **any four** questions.

PART – A

Answer **any five** questions :

(5×6=30)

1. Explain WebApp Design goals.
2. What are the 3 types of box structures in functional specification of Clean room Strategy ?
3. Elaborate on the management spectrum.
4. What basic principles are required to guide software project scheduling ?
5. Explain different categories of software risk.
6. What is business process ? Explain Business Process Re-engineering model.
7. Describe CMMI capability level with an example.
8. Explain software metrics used for Object-Oriented Design.

PART – B

Answer **any four** questions :

(4×10=40)

9. Explain the following agile process model with necessary diagrams :
 - a) Adaptive Software Development (ASD).
 - b) Scrum.

P.T.O.



10. What are the different approaches in software measurement ?
11. Explain in detail on Forward Engineering.
12. Briefly explain the SCM process for WebApps.
13. a) How do small organizations select metrics for measuring software ? 5
 b) Give details on 5 frameworks used in Software Process Improvement. 5
14. Write short notes on : 5
 a) Z specification language. 5
 b) Clean room testing.

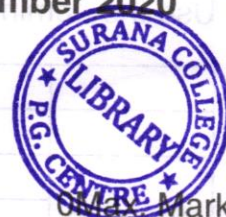


PG – 510

IV Semester M.C.A. Examination, October/November 2020
(CBCS Scheme)

COMPUTER SCIENCE

MCA-404T : Quantitative Techniques



Time : 3 Hours

Max. Marks : 70

Instructions : 1) Part – A : Answer **any five** questions.

2) Part – B : Answer **any four** questions.

PART – A

Answer **any five** questions. **Each** question carries **six** marks. (5×6=30)

1. Define Operation Research. Explain the main phases of Operation Research.
2. A manufacturer of packing material manufactures two types of packing tins round and flat. Major production facilities involved are cutting and joining. The cutting department can process 300 tins of round or 500 tins of flat per hour. The joining department can process 400 tins of round or 300 tins of flat per hour. If the profit contribution of round tins is Rs. 100/- per tin and that of flat is Rs. 80/- per tin. Formulate (only), the problem as linear programming problem.

3. Solve the following LPP by graphical method.

$$\text{Minimize } Z = 20x_1 + 10x_2$$

Subject to

$$x_1 + 2x_2 \leq 40$$

$$3x_1 + x_2 \leq 30$$

$$4x_1 + 3x_2 \geq 60$$

$$x_1, x_2 \geq 0$$

4. What is dynamic programming problem ? Explain the characteristics of Dynamic programming.

5. Solve the following LPP by Big M Method.

$$\text{Minimize } Z = 2x_1 + x_2$$

Subject to Constraint

$$3x_1 + x_2 = 3$$

$$4x_1 + 3x_2 \geq 6$$

$$x_1 + 2x_2 \leq 4$$

$$x_1, x_2 \geq 0$$

P.T.O.



6. Use the dominance principle to solve the following game.

		Player B				
		1	2	3	4	5
Player B	1	6	15	30	21	6
	2	3	3	6	6	4
	3	12	12	24	36	3

7. A company has 4 machines on which to do 3 jobs. Each job can be assigned to one and only one machine. The cost of each job on each machine is given in the following table.

		Machine			
		W	X	Y	Z
Jobs	A	18	24	28	32
	B	8	13	17	18
	C	10	15	19	22

What are the job assignments which will minimize the cost ?

8. Explain the characteristics of Queueing systems.

PART – B

Answer **any four** questions. **Each** question carries **10** marks.

(4×10=40)

9. Find the initial basic feasible solution using VAM and determine the optimum solution by MODI method for the following transportation problem.

		Warehouses				
		W ₁	W ₂	W ₃	W ₄	Capacity
Factories	F ₁	19	30	50	10	7
	F ₂	70	30	40	60	9
	F ₃	40	8	70	20	18
Requirements		5	8	7	14	



10. The table below gives a list of jobs, their duration in days.

Job	1 – 2	1 – 3	1 – 4	2 – 5	3 – 4	3 – 7	4 – 5	4 – 6	5 – 6	4 – 7	6 – 7
Duration	20	24	8	20	16	24	0	18	0	4	12

- 1) Draw the network.
- 2) Determine the critical path.
- 3) Compute ES, EF, LS, LF, TS and FS for each activity.

11. Table below shows jobs, their normal time and cost and crash time and cost for a project.

Activity	Normal		Crash	
	Time (days)	Cost (Rs.)	Time (days)	Cost (Rs.)
1 – 2	6	1,400	4	1,900
1 – 3	8	2,000	5	2,800
2 – 3	4	1,100	2	1,500
2 – 4	3	800	2	1,400
3 – 4	← Dummy →			
3 – 5	6	900	3	1,600
4 – 6	10	2,500	6	3,500
5 – 6	3	500	2	800

Indirect or overhead cost of the project is Rs. 300 per day.

- i) Draw the network of the project.
- ii) What is the normal duration of the project ?
- iii) Find the optimum duration and minimum project cost.
- iv) If all the activities are crashed, what will be the project duration and corresponding cost.

12. Solve given LPP by two-phase method.

$$\text{Max } Z = 5x_1 - 4x_2 + 3x_3$$

Subject to Constraint

$$2x_1 + x_2 - 6x_3 = 20$$

$$6x_1 + 5x_2 + 10x_3 \leq 76$$

$$8x_1 - 3x_2 + 6x_3 \leq 50$$



13. Solve travelling salesman problem.

		To City				
		A	B	C	D	E
From City	A	∞	2	5	7	1
	B	6	∞	3	8	2
	C	8	7	∞	4	7
	D	12	4	6	∞	5
	E	1	3	2	8	∞

14. Write short notes on the following :

- Degeneracy in transportation problem.
- CPM.
- PERT.