No of Pages :4 Course Code : 18XW83

Roll No:
(To be filled in by the candidate)

PSG COLLEGE OF TECHNOLOGY, COIMBATORE 641 004

SEMESTER EXAMINATIONS, APRIL2023

MSc - SOFTWARE SYSTEMS Semester : 8

18XW83 SOFTWARE PROJECT MANAGEMENT

Time : 3 Hours **Maximum Marks : 100**

INSTRUCTIONS:

1. Answer **ALL** questions. Each question carries 20 Marks.
2. Subdivision (a) carries 3 marks each, subdivision (b) carries 7 marks each and subdivision (c) carries 10 marks each.
3. Course Outcome : Table

Qn.1	CO2.	Qn.2	CO1.	Qn.3	CO3	Qn.4	CO4	Qn.5	CO5

1. a) Calculate the Return On Investment (ROI) for a software project development, where the net profit is Rs.75,000/- and total investment is Rs.3,25,000/-. The total duration of the project is estimated to be 5 years.

   b) Identify the actions that could prevent each of the following risks from materializing or could reduce the impact if it did occur :

      i) A disk containing copies of the most up-to-date version of the software under development being corrupted;

      ii) System testing unearths more errors than were expected and takes longer than planned

   c) A car manufacturing company must decide whether to build or buy a software package to keep track of its inventory. Computer experts in that organization estimate that it will cost Rupees 3,25,000/- to buy the necessary software. To build the software in-house, programmers will cost Rs.5000/- each per month. What factors should Manny consider in making his decision? Whether is it better to build? To buy?

2. a) At what stage of a system development project would a prototype be useful as a means of reducing the following uncertainty?

      Students can access details of available placements through intranet. When there is a placement opportunity for which they wish to be considered, they would be able to apply for it electronically. This would cause a copy of their CV (Curriculum Vitae), which would also be held online, to be sent to the potential employer. Details of interviews and placement offers would all be sent by email.

   b) In the following cases, identify the type of the application package to be adopted would be most likely to be bespoke, off the shelf or COTS. Justify your answer.

      i) "A system is required by government that calculates, records and notifies individual tax payers about income tax charges."

      ii) "An expert system for use in a hospital to diagnose the causes of eye complaints"

c) A software has to be developed which will extract employee records from the employee data base who are eligible for income tax deduction. The Employee Identification number, Name and department details will be taken from the employee database. A report has to be printed showing Id number, Name, department, Gross salary and income tax amount to be deducted. Assume that report is complex and other elements are of average difficulty. An option is required to view the details of income tax for a given employee on the screen.

In addition to above, system requires

- Significant data communication
- Performance is very critical
- Designed code may be moderately reusable
- System is not designed for multiple installations in different organizations

Other complexity adjustment factors are treated as average.

Estimate the effort required for developing this system using Albrecht function points analysis method. Specify the assumptions you have made during this estimation process.

Weighting Factor

Item	Simple	Average	Complex
External inputs	3	4	6
External outputs	4	5	7
External inquiries	3	4	6
External files	7	10	15
Internal files	5	7	10

3. a) In a "V" process model the review that is held after the system has been implemented is shown as possibly feeding corrections back to the feasibility study which may have been conducted months or years before. How would this work in practice?

b) Which Process model will be used to develop the following system? Justify.

i) A system to administer a student loans scheme.

ii) Airline Reservation system, which is intended to replace an existing system.

c) Amanda has produced a precedence network for the software project (shown in figure) and used this as a basis for a resource requirements list, part of which is shown in the table. Construct a resource histogram and a bar chart for scheduling the resources. Explain how this resource histogram is useful indetermining whether the resources are used optimally in this project or they are kept idle.

TABLE : PART OF AMANDA'S RESOURECE REQUIREMENTS LIST

STAGE	ACTIVITY	RESOURCE	DAYS	QUANTITY	NOTES
ALL		PROJECT MANAGER	104 F/T		
1	ALL	WORKSTATION		34	CHECK SOFTWARE AVAILABILITY
	IOE/P/1	SENIOR ANALYST	34 F/T		
2	ALL	WORK STATION	---	3	ONE PER PERSON WOULD BE IDEAL
	IOE/P/2	ANALYST/DESIGNER	20 F/T		
	IOE/P/3	ANALYST/DESIGNER	15 F/T		
	IOE/P/4	ANALYST/DESIGNER	25 F/T		
	IOE/P/5	ANALYST/DESIGNER	15 F/T		COULD USE ANALYST/PROGRAMMER
3	ALL	WORKSTATION	---	2	
	IOE/P/6	SENIOR ANALYST	2 F/T		
4	ALL	WORKSTATION	-----	3	AT STAGE 2
	IOE/P/7	ANALYST /DESIGNER	7 F/T		
	IOE/P/8	ANALYST/DESIGNER	6 F/T		
	IOE/P/9	ANALYST/DESIGNER	4 F/T		
	IOE/P/10	ANALYST/DESIGNER	4 F/T		
5	ALL	WORKSTATION	---	4	1 PER PROGRAMMER IF CONTRACT PROGRAMMERS USED
	ALL	OFFICE SPACE	---		
	IOE/P/11	PROGRAMMER	30 F/T		
	IOE/P/12	PROGRAMMER	28 F/T		
	IOE/P/13	PROGRAMMER	15 F/T		
	IOE/P/14	PROGRAMMER	25 F/T		
6	ALL	FULL MACHINE ACCESS	------		APPROX. 16 HOURS FOR FULL SYSTEM TEST
	IOE/P/15	ANALYST/DESIGNER	6 F/T		

4. a) Is it possible to represent parallel activities in a Network Model? Justify your answer

   b) What kinds of power would the following people have?

      i) An Information Technology expert, hired for inspecting performance measures in a software product.

      ii) The Managing Director of an organization who has told his employees that they must accept a new contract or face the sack.

   c) Consider the four project cash flows given in the table and select the best project according to discounted cash flow (DCF) techniques.

Year	Project 1	Project 2	Project 3	Project 4	Discount Rate @10%
0	-100,000	-1,000,000	-100,000	-120,000	1
1	10,000	200,000	30,000	30,000	0.9091
2	10,000	200,000	30,000	30,000	0.8264
3	10,000	200,000	30,000	30,000	0.7513
4	20,000	200,000	30,000	30,000	0.6830
5	100,000	300,000	30,000	75,000	0.6209
Net Profit	50,000	100,000	50,000	75,000	

5. a) What is the difference between float and slack?

   b) Consider a software project with five different activities. A1 thru A5. Duration of the five activities (in days) are 15,10, 12, 25 and 10 respectively. A2 and A4 can start when A1 is complete. A3 can start when A2 is complete. A5 can start when both A3 and A4 are complete. Draw the Gantt chart to represent this project schedule.

   c) Draw an activity network using CPM (Critical Path Method) convention for the project details given below :

ACTIVITY	DURATION (WEEKS)	PRECEDENTS
A-HARDWARE SELECTION	6	
B-SOFTWARE DESIGN	4	
C-INSTALL HARDWARE	3	A
D-CODE & TEST	4	B
E-WRITE USER MANUALS	10	
F-USER TRAINING	3	E

/END/

FD/RL