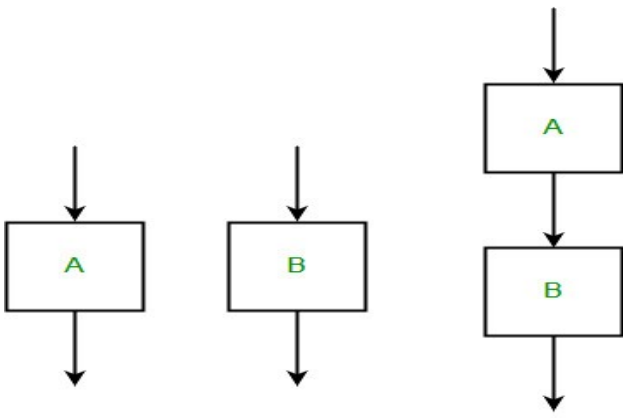
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2018

Course: Software Engineering & Project Management (CSEG 265) **Semester: IV**
Program: B.Tech. CS IBM All Branches
Time: 03 hrs. **Max. Marks: 100**

Instructions: Attempt all Questions from Sections A, B & C. There is internal choice in Sections B and C.

SECTION A **5X4 = 20 MARKS**

S. No.		Marks	CO
Q 1	Explain positive and negative test cases? Give one example of each	[4]	CO5
Q 2	How do you measure coupling? The coupling between different modules of a software is categorized as follows: 1. Content Coupling 2. Common Coupling 3. Control Coupling 4. Stamp Coupling 5. Data Coupling Rank the above Coupling types in the order of strongest (least desirable) to weakest (most desirable).	[4]	CO2
Q 3	Based on a) User participation and b) Project Type and Associated Risk, which of these models would you select : Waterfall / Spiral / Prototyping ?	[4]	CO1
Q 4	A company needs to develop DSP software for one of its newest inventions. The software is expected to have 40000 lines of code. Determine the effort needed to develop this software using the basic COCOMO model (Embedded system mode)	[4]	CO4
Q 5	The cyclomatic complexity of each of the modules A & B shown below is 10. Compute cyclomatic complexity of the sequential integration shown on the right hand side? 	[4]`	CO5

SECTION B **10X4 = 40 MARKS**

There is internal choice in question no. 9

Q 6 a)	Do you design software when you "write" a program? What makes software design different from coding?	[5]	CO2
Q 6 b)	Give three differences between flow chart and structure chart in table form.	[5]	CO3
Q 7	**The following is the comment written for a C function.** /* This function computes the roots of a quadratic equation a.x^2 + b.x + c= 0.	[10]	CO5

The function stores two real roots in *root1 and *root2 and returns the status of validity of roots. It handles four different kinds of cases.

(i) When coefficient a is zero irrespective of discriminant

(ii) When discriminant is positive

(iii) When discriminant is zero

(iv) When discriminant is negative.

Only in case (ii) and (iii) the stored roots are valid. Otherwise 0 is stored in roots. The function returns 0 when the roots are valid and -1 otherwise.

The function also ensures root1 >= root2

```
int get_QuadRoots( float a, float b, float c,
  float *root1, float *root2);          */
```

A software test engineer is assigned the job of doing black box testing. He comes up with the following test cases, many of which are redundant.

Test Case	Input Set			Expected Output Set		
	a	b	c	Root1	Root2	Return Value
T1	0	0	7	0	0	-1
T2	0	1	3	0	0	-1
T3	1	2	1	-1	-1	0
T4	4	-12	9	1.5	1.5	0
T5	1	-2	-3	3	-1	0
T6	1	1	4	0	0	-1

Which one of the following option provide the set of non-redundant tests using equivalence class partitioning approach from input perspective for black box testing?

(A) T1,T2,T3,T6
(B) T1,T3,T4,T5
(C) T2,T4,T5,T6
(D) T2,T3,T4,T5

Justify your answer by computing the discriminant for each test case and finding the equivalence class corresponding to each test case.

Q 8 a)	A program has 5 EIs of simple type, 4 EOs of average type, 4 EQs of complex type, 3 ILFs of average type and 4 EIFs of complex type. The complexity adjustment factors are to be taken as average. Compute the FP for this program	**[5]**	**CO3**
b)	What is significance of the CMM Model? Explain the different levels of CMM model	**[5]**	**CO3**
	int sort (int x[ ], int n)	**[10]**	**CO3**

Q 9	{
	int i, j, save, im1;
	/*This function sorts array x in ascending order */
	If (n< 2) return 1;
	for (i=2; i< =n; i++)
	{
	im1=i-1;
	for (j=1; j< =im1; j++)
	if (x[i] < x[j])
	{
	Save = x[i];
	x[i] = x[j];
	x[j] = save;
	}
	}
	return 0;
	}
	List out the operators and operands. Also compute measures like Program Length, Vocabulary, Program Volume, Difficulty and Effort.		

	OR		

Q 9	**The following program is to be tested for statement coverage:**
	begin
	if (a = = b) {S1; exit;}
	else if (c= = d) {S2;}
	else {S3; exit;}
	S4;
	end
	The test cases T1, T2, T3 and T4 given below are expressed in terms of the properties satisfied by the values of variables a, b, c and d. The exact values are not given.
	T1 : a, b, c and d are all equal
	T2 : a, b, c and d are all distinct
	T3 : a = b and c != d
	T4 : a != b and c = d
	Which of the test suites given below ensures coverage of statements S1, S2, S3 and S4? Give reasons in support of your answer.
	(A) T1, T2, T3
	(B) T2, T4
	(C) T3, T4
	(D) T1, T2, T4
		[10]	**CO5**

	SECTION-C	**(20X2 = 40 MARKS)**	

ATTEMPT ALL QUESTIONS.

NOTE : THERE IS INTERNAL CHOICE IN Q.11 (Q.11 has two parts and both have to be attempted)

Q10 a)	Consider a program for the determination of division of a student based on the marks in three subjects. Its input is a triple of positive integers (say mark1, mark2, and mark3 and values are from interval [0,100]. The division is calculated according to the following rules : **Average** **Division** 75-100 First division with distinction 60-74 First division 50-59 Second division 40-49 Third division 0-39 Fail Here Average = (mark1 + mark2 + mark3) / 3 The program output may have one of the following words : [Fail, Third Division, Second Division, First Division, First Division with distinction] **Design the boundary value test cases.**	**[10]**	**CO5**
Q10 b)	Discuss risk management activities in a project. How does staff turnover problem affect software projects?	**[10]**	**CO4**
Q11 a)	A company projecting revenue of 40 lacs in first year and the revenue is going to increase @10 lacs every year for the next 3 years in succession, after which revenue decreases by 15 lacs in the fifth year and thus will be closed after 5 years. The fixed initial investment for the project is 150 lacs and working capital requirement is 30 lacs. Compute these for the project : a) Payback Period b) ROI c) NPV assuming 12.5% discount rate	**[3+3+ 6]**	**CO4**
Q11 b)	Explain any 4 requirements elicitation techniques	**[8]**	**CO2**
	OR		

Q11 a)	Draw control flow graph for the program hence compute Cyclomatic complexity using any two methods, and draw the Graph matrix for the same.
	int compute_gcd (int x, int y) {
	1 while (x ! = y) {
	2 if (x>y) then
	3 x = x-y;
	4 else y = y-x;
	5 }
	6 return x; }
		[4+4+ 4]	**CO5**

Q11 b)	Why is the SRS document also known as the black-box specification of a system?	**[8]**	**CO2**

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Programme	:	**B.Tech. CS- IBM All Branches**					
Semester	:	**IV**					
Name of the Course	:	**Software Engineering & Project Management**					
Course Code	:	**CSEG 265**					
Name of Question Paper Setter	:	**Mr. Ravi Prakash**					
Employee Code	:	**40001062**					
Mobile & Extension	:	**8979048096, 1176**					
Note: Please mention additional Stationery to be provided, during examination such as Table/Graph Sheet etc. else mention "NOT APPLICABLE":							

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