COMPUTER SCIENCE

PAPER-2

In Single Video

ALL PYQs

MAHA MARATHON

SOFTWARE ENGINEERING

LIVE

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DAILY 4-5PM | 7-8PM

By Rashmi Ma'am

Combine CS
The Extra Step

June 1st - 15th Schedule	Marathon Session + Practice Ques	
youTube Free Class	PAPER-1 Practice Ques.	PAPER-2 CS Practice Ques.
Way to JRF 2022	4:30 pm - 5:30 pm	9-10 pm
Monday		
Tuesday, 31st May 2022	Practice MCQ Teaching	Practice PYQ AI
Wednesday, 1st June 2022	Practice MCQ Research	Practice Expected MCQ AI
Thursday, 2nd June 2022	Practice MCQ Communication	Practice PYQ SE
Friday, 3rd June 2022	Practice MCQ ICT	Practice Expected MCQ SE
Saturday, 4th June 2022	Practice MCQ LR	Practice PYQ DBMS
Sunday, 5th June 2022	Practice MCQ HE	Practice Expected Bigdata + NoSQL
Monday, 6th June 2022	Practice MCQ PDE	Practice Expected Data Mining
Tuesday, 7th June 2022	Practice MCQ Indian Logic	Practice SQL
Wednesday, 8th June 2022	Practice PYQ TOC + Compiler	Practice PYQ TOC + Compiler
Thursday, 9th June 2022	Practice PYQ CN	Practice PYQ CN
Friday, 10th June 2022	Practice PYQ OS	Practice PYQ OS
Saturday, 11th June 2022	Practice PYQ Discrete Math	Practice PYQ Discrete Math
Sunday, 12th June 2022	Practice DSA	Practice DSA
Monday, 13th June 2022	Practice COA	Practice COA
Tuesday, 14th June 2022	Practice CG	Practice CG
Wednesday, 15th June 2022	Practice Cloud Computing	Practice Web Programming

Revisio

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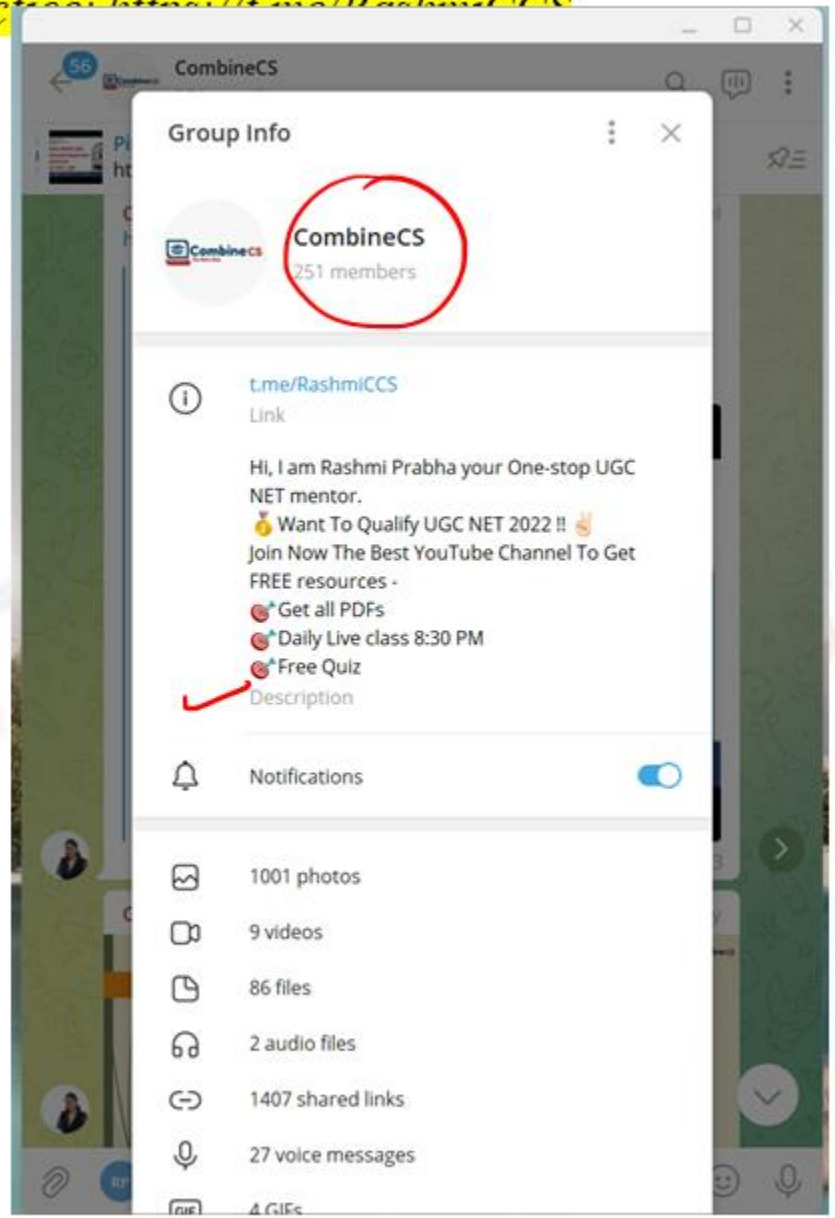

SE (Year)	Topics	No. of Ques.
2021	Testing, SRS, SCM, CMM, Clean Room, Process Model, Reliability, 2 Open Ques.	9
2022	Agile Model, Cohesion & Coupling, COCOMO Model, Maintenance, Quality, Testing,	

Q1) The Functions Point (FP) metric is

1. Calculated from user requirement
2. Calculated from lines of code
3. Calculated from software complexity assessment
4. None of the above

Reliability

Q1) The Functions Point (FP) metric is

FP S/W

1. Calculated from user requirement
2. Calculated from lines of code
3. Calculated from software complexity assessment
4. None of the above

Q2) The Function Point (FP) calculated for a software project are often used to obtain an estimate of Lines of Code (LOC) required for that project. Which of the following statements is FALSE in this context.
(GATE 2005)

1. The relationship between FP and LOC depends on the programming language used to implement the software.
2. LOC requirement for an assembly language implementation will be more for a given FP value, than LOC for implementation in COBOL
3. On an average, one LOC of C++ provides approximately 1.6 times the functionality of a single LOC of FORTRAN
4. FP and LOC are not related to each other

Q2) The Function Point (FP) calculated for a software project are often used to obtain an estimate of Lines of Code (LOC) required for that project. Which of the following statements is FALSE in this context.
(GATE 2005)

1. The relationship between FP and LOC depends on the programming language used to implement the software.
2. LOC requirement for an assembly language implementation will be more for a given FP value, than LOC for implementation in COBOL
3. On an average, one LOC of C++ provides approximately 1.6 times the functionality of a single LOC of FORTRAN
4. FP and LOC are not related to each other

Q3) A legacy software system has 940 modules. The latest release require that 90 of these modules be changed. In addition, 40 new modules were added and 12 old modules were removed. Compute the software maturity index for the system.

1. 0.725
2. 0.923
3. 0.849
4. 0.524

Q3) A legacy software system has 940 modules. The latest release require that 90 of these modules be changed. In addition, 40 new modules were added and 12 old modules were removed. Compute the software maturity index for the system.

1. 0.725
2. 0.923
3. 0.849
4. 0.524

SMI – is the Software Maturity Index value.
Mt – is the number of software functions/modules in the current release.
Fc – is the number of functions/modules that contain changes from the previous release.
Fa – is the number of functions/modules that contain additions to the previous release.
Fd – is the number of functions/modules that are deleted from the previous release.

learn

MI = Mt – (Fa + Fc + Fd) / Mt
SMI = (940 - (40 + 90 + 12)) /940
= 0.8489

Q4)Assume the following regarding the development of a software system P: - Estimated lines of code of P : 33, 480 LOC - Average productivity for P : 620 LOC per person-month - Number of software developers : 6 - Average salary of a software developer : ` 50,000 per month If E, D and C are the estimated development effort (in person-months), estimated development time (in months), and estimated development cost (in ` Lac) respectively, then (E, D, C) = _____

1. (48, 8,24)
2. (54, 9, 27)
3. (60,10,30)
4. (42, 7,21)

Productivity = Size/EP / Time

Effort = Size(EP/LOC) / Productivity

Time =

Cost =

Q4)Assume the following regarding the development of a software system P: - Estimated lines of code of P : 33, 480 LOC - Average productivity for P : 620 LOC per person-month - Number of software developers : 6 - Average salary of a software developer : ` 50,000 per month If E, D and C are the estimated development effort (in person-months), estimated development time (in months), and estimated development cost (in ` Lac) respectively, then (E, D, C) =_____

1. (48, 8,24)
2. (54, 9, 27)
3. (60,10,30)
4. (42, 7,21)

Effort = LOC/Average productivity
= 33,480 / 620 = 54
Development Time = Effort / person-month
= 54 / 6 = 9 months
Cost = 50,000 * 6 * 9 = 27 lac

Cost = Time x salary

Q5) The availability of a complex software is 90%. Its Mean Time Between Failure (MTBF) is 200 days. Because of the critical nature of the usage, the organization deploying the software further enhanced it to obtain an availability of 95%. In the process, the Mean Time To Repair (MTTR) increased by 5 days. What is the MTBF of the enhanced software (GATE 2005)

1. 205 days
2. 300 days
3. 500 days
4. 700 days

Q5) The availability of a complex software is 90%. Its Mean Time Between Failure (MTBF) is 200 days. Because of the critical nature of the usage, the organization deploying the software further enhanced it to obtain an availability of 95%. In the process, the Mean Time To Repair (MTTR) increased by 5 days. What is the MTBF of the enhanced software **(GATE 2005)**

1. 205 days
2. 300 days
3. 500 days
4. 700 days

Availability = MTBF/(MTBF + MTTR)

Option 1 : 0.9 = 200/(200 + a) = 22.22

Case 2 :0.95 = b/(b+22.22+5)= 517.18

Q6) A server crashes on the average once in 30 days, that is, the Mean Time Between Failures (MTBF) is 30 days. When this happens, it takes 12 hours to reboot it, that is, the Mean Time to Repair (MTTR) is 12 hours. The availability of server with these reliability data values is approximately : (NET July 2016)

MTTR
MTBF

1. 96.3%
2. 97.3%
3. 98.3%
4. 99.3%

Modify.

Q6) A server crashes on the average once in 30 days, that is, the Mean Time Between Failures (MTBF) is 30 days. When this happens, it takes 12 hours to reboot it, that is, the Mean Time to Repair (MTTR) is 12 hours. The availability of server with these reliability data values is approximately : (NET July 2016)

1. 96.3%
2. 97.3%
3. 98.3%
4. 99.3%

MTBF = 30 days = 30 * 24 = 720 hour.
MTTR = 12 hour.
Availability(A) = MTBF / (MTBF + MTTR) i.e. A = 720 / (720 + 12) = 0.9836 = 98.36%.

Q7) A software system crashed 20 times in the year 2017 and for each crash, it took 2 minutes to restart. Approximately, what was the software availability in that year?

1. 96.9924%
2. 97.9924%
3. 98.9924%
4. 99.9924%

Q7) A software system crashed 20 times in the year 2017 and for each crash, it took 2 minutes to restart. Approximately, what was the software availability in that year?

Concept & Math

+2

1. 96.9924%
2. 97.9924%
3. 98.9924%
4. 99.9924%

365 days have 525600 minutes. It takes 2 minutes to restart the computer In 2017 computer crash for 20 times i.e. system was available for 525560 minutes Software availability = 525560 / 525600 = .999924 or 99.9924 %

Q8) In unit testing of a module, it is found that for a set of test data, at the maximum 90% of the code alone were tested with the probability of success 0.9. The reliability of the module is....

1. Greater than 0.9
2. Equal to 0.9
3. At most 0.81
4. At least 0.81

Q8) In unit testing of a module, it is found that for a set of test data, at the maximum 90% of the code alone were tested with the probability of success 0.9. The reliability of the module is…. (ISRO 2018)

1. Greater than 0.9
2. Equal to 0.9
3. At most 0.81
4. At least 0.81

Code tested maximum 90% = 0.9 Probability of success = 0.9 So, reliability of the module = atmost 0.9 * 0.9 = 0.81

09

A Software project was estimated at 864 Function Points. A six person team will be assigned to project consisting of a requirement gathering person, one designer, two programmers and two testers. The salary of the designer is ₹70,000 per month, requirement gatherer is ₹50,000 per month, programmer is ₹60,000 per month and a tester is ₹60,000 per month. Average productivity for the team is 12 FP per person month. Which of the following represents the projected cost of the project?

(1) ₹33,20,000

(2) ₹43,20,000

(3) ₹33,10,000

(4) ₹22,10,000

A Software project was estimated at 864 Function Points. A six person team will be assigned to project consisting of a requirement gathering person, one designer, two programmers and two testers. The salary of the designer is ₹70,000 per month, requirement gatherer is ₹50,000 per month, programmer is ₹60,000 per month and a tester is ₹60,000 per month. Average productivity for the team is 12 FP per person month. Which of the following represents the projected cost of the project?

(1) ₹33,20,000

(2) ₹43,20,000

(3) ₹33,10,000

(4) ₹22,10,000

Function Point = 864
Average Productivity = 12 per FP
6 person are involved in a project
Total = how many months?
864 / 12 * 6 = 12 month
Total cost = 1 requirement Gathering + 2 Programmer + 2 Tester + 1 designer
= 50,000 + 60,000*2 + 60,000*2 + 70,000
= 3,60,000 * 12
= 43,20,000

JA-087-17

352

A software project was estimated at 352 Function Points (FP). A four person team will be assigned to this project consisting of an architect, two programmers, and a tester. The salary of the architect is ₹ 80,000 per month, the programmer ₹ 60,000 per month and the tester ₹ 50,000 per month. The average productivity for the team is 8 FP per person month. Which of the following represents the projected cost of the project ?

(1) ₹ 28,16,000
(2) ₹ 20,90,000
(3) ₹ 26,95,000
(4) ₹ 27,50,000

JA-087-17

A software project was estimated at 352 Function Points (FP). A four person team will be assigned to this project consisting of an architect, two programmers, and a tester. The salary of the architect is ₹ 80,000 per month, the programmer ₹ 60,000 per month and the tester ₹ 50,000 per month. The average productivity for the team is 8 FP per person month. Which of the following represents the projected cost of the project ?

(1) ₹ 28,16,000
(2) ₹ 20,90,000
(3) ₹ 26,95,000
(4) ₹ 27,50,000

3s

Function Point = 352
Average Productivity = 8 per FP
4 person are involved in a project
Total = how many months?
352 / 8 * 4 = 11 month
Total cost = Architect + 2 Programmer + Tester
= 80,000 + 60,000*2 + 50,000
= 2,50,000 * 11
= 27,50,000

2022

Cost = Time x Salary

A Company has a choice of two languages L_1 and L_2 to develop a software for their client. Number of LOC required to develop an application in L_2 is thrice the LOC in language L_1. Also, software has to be maintained for next 10 years. Various parameters for two languages are given below to decide which language should be preferred for development.

PARAMETER	L_1	L_2
Man-year needed for development	LOC/1000	LOC/1000
Development cost	Rs.70,000	Rs.90,000
Cost of Maintenance per year	Rs.1,00,000	Rs.40,000

Total cost of project include cost of development and maintenance. What is the LOC for L_1 for which cost of developing the software with both languages must be same?

(1) 2000 (2) 6000

(3) 3000 (4) 5000

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Total cost of project include cost of development and maintenance. What is the LOC for L_1 for which cost of developing the software with both languages must be same?

(1) 2000
(2) 6000
(3) 3000
(4) 5000

Net 2019

L1 = X

L2 = 3x

Cost = Man power * development cost + extra cost

L1 = LOC /1000 * 70,000 + 10 * 1,00,000

L2 = 3 LOC/1000 * 90,000 + 10 * 40,000

70,000 LOC + 10,00,000 = 2,70,000 LOC + 4,00,000

2,00 LOC = 6,00,000

LOC = 6,00,000 / 200

LOC = 3,000

L1 (LOC) = 3000

A company needs to develop a strategy for software product development for which it has a choice of two programming languages L1 and L2. The number of lines of code (LOC) developed using L2 is estimated to be twice the LOC developed with LI. The product will have to be maintained for five years. Various parameters for the company are given in the table below.

Parameter	Language L1	Language L2
Man years needed for development	LOC/10000	LOC/10000
Development cost per man year	Rs. 10,00,000	Rs. 7,50,000
Maintenance time	5 years	5 years
Cost of maintenance per year	Rs. 1,00,000	Rs. 50,000

Total cost of the project includes cost of development and maintenance. What is the LOC for L1 for which the cost of the project using L1 is equal to the cost of the project using L2?

A. 10,000
B. 5,000
C. 7,500
D. 75,000

ISRO 2016/GATE 2011

Net 2019

A company needs to develop a strategy for software product development for which it has a choice of two programming languages L1 and L2. The number of lines of code (LOC) developed using L2 is estimated to be twice the LOC developed with LI. The product will have to be maintained for five years. Various parameters for the company are given in the table below.

ISRO 2016/GATE 2011

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Man years needed for development	LOC/10000	LOC/10000
Development cost per man year	Rs. 10,00,000	Rs. 7,50,000
Maintenance time	5 years	5 years
Cost of maintenance per year	Rs. 1,00,000	Rs. 50,000

Total cost of the project includes cost of development and maintenance. What is the LOC for L1 for which the cost of the project using L1 is equal to the cost of the project using L2?

A. 10,000
B. 5,000
C. 7,500
D. 75,000

Let LOC of L1=x, so LOC of L2=2x

Now,

$(x/10000)*1000000 + 5*100000 = (2x/10000)*750000 + 5*50000$

Solving for x, we get x =5000

Q13) The test suite (set of test input) used to perform unit testing on module could cover 70% of the code. What is the reliability of the module if the probability of success is 0.95 during testing? (ISRO 2014)

1. 0.665 to 0.95
2. At the most 0.665
3. At the most 0.95
4. At least 0.665

Q13) The test suite (set of test input) used to perform unit testing on module could cover 70% of the code. What is the reliability of the module if the probability of success is 0.95 during testing? (ISRO 2014)

1. 0.665 to 0.95
2. At the most 0.665
3. At the most 0.95
4. At least 0.665

Reliability = coverage * probability of success = 0.7 * 0.95 = 0.665. Probability of success is at most 0.665 %

Q14) If in a software project the number of user input, user output, enquiries, files and external interfaces are (15, 50, 24, 12, 8), respectively, with complexity average weighing factor. The productivity if effort = 70 percent-month is ….(ISRO 2015)

A. 110.54
B. 408.74
C. 304.78
D. 220.14

Q14) If in a software project the number of user input, user output, enquiries, files and external interfaces are (15, 50, 24, 12, 8), respectively, with complexity average weighing factor. The productivity if effort = 70 percent-month is ....(ISRO 2015)

Table

L	A	H
3	4	6
4	5	7
3	4	6

5

10

15x + 50x + 24x * 12x + 8x

A. 110.54
B. 408.74
C. 304.78
D. 220.14

Q15) Which of the following are NOT considered when computing function points for a software project? (GATE 2008)

(O1) External inputs and outputs
(O2) Programming language to be used for the implementation
(O3) User interactions
(O4) External interfaces
(O5) Number of programmers in the software project
(O6) Files used by the system

A. O2, O3
B. O1, O5
C. O4, O6
D. O2, O5

Q15) Which of the following are NOT considered when computing function points for a software project? (GATE 2008)

(O1) External inputs and outputs
(O2) Programming language to be used for the implementation
(O3) User interactions
(O4) External interfaces
(O5) Number of programmers in the software project
(O6) Files used by the system

A. O2, O3
B. O1, O5
C. O4, O6
D. O2, O5

Q16) In a software project, COCOMO (Constructive Cost Model) is used to estimate……. (GATE 2004)

1. effort and duration based on the size of the software
2. size and duration based on the effort of the software
3. effort and cost based on the duration of the software
4. size, effort and duration based on the cost of the software

Q16) In a software project, COCOMO (Constructive Cost Model) is used to estimate……. (GATE 2004)

1. effort and duration based on the size of the software
2. size and duration based on the effort of the software
3. effort and cost based on the duration of the software
4. size, effort and duration based on the cost of the software

basic COCOMO equations take the form
Effort Applied (E) = ab(KLOC)bb [person-months]
Development Time (D) = cb(Effort Applied)db [months]
People required (P) = Effort Applied / Development Time

Q17) A company needs to develop digital signal processing software for one of its newest inventions. The software is expected to have 20000 lines of code. The company needs to determine the effort in person-months needed to develop this software using the basic COCOMO model. The multiplicative factor for this model is given as 2.2 for the software development on embedded systems, while the exponentiation factor is given as 1.50. What is the estimated effort in person-months? (ISRO 2016)

A. 196.77
B. 206.56
C. 199.56
D. 210.68

Q17) A company needs to develop digital signal processing software for one of its newest inventions. The software is expected to have 20000 lines of code. The company needs to determine the effort in person-months needed to develop this software using the basic COCOMO model. The multiplicative factor for this model is given as 2.2 for the software development on embedded systems, while the exponentiation factor is given as 1.50. What is the estimated effort in person-months? (ISRO 2016)

20,000 LOC
20 KLOC

$E = a^b (KLOC)^d$

A. 196.77
B. 206.56
C. 199.56
D. 210.68

In the Constructive Cost Model (COCOMO),
Effort Applied (E) = ab(KLOC)bb [person months]
= 2.2 x(20)1.50 = 2.2 x 89.44 = 196.77

$2.2 * (20)^{1.50}$

Q18) Estimation of software development effort for organic software in basic COCOMO is... (ISRO 2017)

Effort

A. E = 2.0(KLOC)1.05PM
B. E = 3.4(KLOC)1.06PM
C. E = 2.4(KLOC)1.05PM
D. E = 2.4(KLOC)1.07PM

Q18) Estimation of software development effort for organic software in basic COCOMO is... (ISRO 2017)

A. E = 2.0(KLOC)1.05PM
B. E = 3.4(KLOC)1.06PM
C. E = 2.4(KLOC)1.05PM
D. E = 2.4(KLOC)1.07PM

Q19) Consider the basic COCOMO model where E is the effort applied in person-months, D is the development time in chronological months, KLOC is the estimated number of delivered lines of code (in thousands) and a_b, b_b, c_b, d_b have their usual meanings. The basic COCOMO equations are of the form. (GATE 2015)

1. E = ab(KLOC) exp(bb), D = cb(E) exp(db)
2. D = ab(KLOC) exp(bb), E = cb(D) exp(db)
3. E = ab exp(bb), D = cb(KLOC) exp(db)
4. E = ab exp(db), D = cb(KLOC) exp(bb)

Q19) Consider the basic COCOMO model where E is the effort applied in person-months, D is the development time in chronological months, KLOC is the estimated number of delivered lines of code (in thousands) and a_b, b_b, c_b, d_b have their usual meanings. The basic COCOMO equations are of the form. (GATE 2015)

1. E = ab(KLOC) exp(bb), D = cb(E) exp(db)
2. D = ab(KLOC) exp(bb), E = cb(D) exp(db)
3. E = ab exp(bb), D = cb(KLOC) exp(db)
4. E = ab exp(db), D = cb(KLOC) exp(bb)

Effort Applied (E) = ab(KLOC)bb [person-months]
Development Time (D) = cb(Effort Applied)db [months]
People required (P) = Effort Applied / Development Time [count]

Q20) A company needs to develop digital signal processing software for one of its newest inventions. The software is expected to have 40000 lines of code. The company needs to determine the effort in person-months needed to develop this software using the basic COCOMO model. The multiplicative factor for this model is given as 2.8 for the software development on embedded systems, while the exponentiation factor is given as 1.20. What is the estimated effort in person-months?
(GATE 2011)

A. 234.25
B. 932.50
C. 287.80
D. 122.40

Q20) A company needs to develop digital signal processing software for one of its newest inventions. The software is expected to have 40000 lines of code. The company needs to determine the effort in person-months needed to develop this software using the basic COCOMO model. The multiplicative factor for this model is given as 2.8 for the software development on embedded systems, while the exponentiation factor is given as 1.20. What is the estimated effort in person-months?
(GATE 2011)

A. 234.25
B. 932.50
C. 287.80
D. 122.40

Effort Applied (E) = ab(KLOC)bb [person-months]
= 2.8 x(40)1.20
= 2.8 x 83.65
= 234.25

Q21) A simple stand - alone software utility is to be developed in 'C' programming by a team of software experts for a computer running Linux and the overall size of this software is estimated to be 20,000 lines of code. Considering (a, b) = (2.4, 1.05) as multiplicative and exponention factor for the basic COCOMO effort estimation equation and (c, d) = (2.5, 0.38) as multiplicative and exponention factor for the basic COCOMO development time estimation equation, approximately how long does the software project take to complete ? (NET 2017)

A. 10.52 months
B. 11.52 months
C. 12.52 months
D. 14.52 months

Q21) A simple stand - alone software utility is to be developed in 'C' programming by a team of software experts for a computer running Linux and the overall size of this software is estimated to be 20,000 lines of code. Considering (a, b) = (2.4, 1.05) as multiplicative and exponention factor for the basic COCOMO effort estimation equation and (c, d) = (2.5, 0.38) as multiplicative and exponention factor for the basic COCOMO development time estimation equation, approximately how long does the software project take to complete ? (NET 2017)

A. 10.52 months
B. 11.52 months
C. 12.52 months
D. 14.52 months

$2.5 * (55.756)^{0.38}$

20,000 LOC = 20KLOC
Effort = a*(KLOC)^b PM
Development Time = c*(Effort)^d Months
Effort = 2.4*(20)^{1.05} PM = 55.756 PM
T_{dev} = 2.5*(55.756)^{0.38} Months = 11.52 Months

Q22) Assume that the delivered lines of code L of a software is related to the effort E in person months and duration t in calendar months by the relation L P* $(E/B)^{1/3} * t^{4/3}$, where P and B are two constants for the software process and skills factor. For a software project, the effort was estimated to be 20 person months and the duration was estimated to be 8 months. However, the customer asked the project team to complete the software project in 4 months. What would be the required effort in person months? (GATE 2004)

A. 10
B. 40
C. 160
D. 320

Q22) Assume that the delivered lines of code L of a software is related to the effort E in person months and duration t in calendar months by the relation L P* $(E/B)^{1/3} * t^{4/3}$, where P and B are two constants for the software process and skills factor. For a software project, the effort was estimated to be 20 person months and the duration was estimated to be 8 months. However, the customer asked the project team to complete the software project in 4 months. What would be the required effort in person months? (GATE 2004)

A. 10
B. 40
C. 160
D. ~~320~~

Given, Initial Effort in Person, E1 = 20 and Initial time, T1 = 8 months Final Effort in Person, E2 = ? Final time, T2 = 4 months Equating both equation, P* (E1/B)1/3 * t1 (4/3) = P* (E2/B)1/3 * t2 (4/3) we get, E2 = 320.

Q23) A signal processor software is expected to operate for 91.25 days after repair, and the mean software repair time is expected to be 5 minutes. Then, the availability of the software is: (NET NOV 2017)

A. 96.9862%
B. 97.9862%
C. 98.9962%
D. 99.9962%

Q23) A signal processor software is expected to operate for 91.25 days after repair, and the mean software repair time is expected to be 5 minutes. Then, the availability of the software is: (NET NOV 2017)

A. 96.9862%
B. 97.9862%
C. 98.9962%
D. 99.9962%

Availability = MTBF /(MTBF+MTTR)*100 = 91.25*24*60 / (91.25*24*60+5)*100 = 99.9962%

Q24) What is the availability of a software with the following reliability figures? Mean Time Between Failure (MTBF) = 25 days Mean Time To Repair (MTTR) = 6 hours

(GATE 2004)

25 * 24

A. 1%
B. 24%
C. 99%
D. 99.009%

Q24) What is the availability of a software with the following reliability figures? Mean Time Between Failure (MTBF) = 25 days Mean Time To Repair (MTTR) = 6 hours

(GATE 2004)

Availability = MTBF/(MTBF+MTTR) * 100
= 25*24/(25*24 + 6) * 100 = 99.009 %

A. 1%
B. 24%
C. 99%
D. 99.009%

Q25) Consider a software program that is artificially seeded with 100 faults. While testing this program, 159 faults are detected, out of which 75 faults are from those artificially seeded faults. Assuming that both real and seeded faults are of same nature and have same distribution, the estimated number of undetected real faults is _____. (GATE 2015)

A. 28
B. 175
C. 56
D. 84

Q25) Consider a software program that is artificially seeded with 100 faults. While testing this program, 159 faults are detected, out of which 75 faults are from those artificially seeded faults. Assuming that both real and seeded faults are of same nature and have same distribution, the estimated number of undetected real faults is _____. (GATE 2015)

A. 28
B. 175
C. 56
D. 84

Total faults detected = 159
Real faults detected among all detected faults = 159 - 75
= 84
Since probability distribution is same, total number of real faults is (100/75)*84 = 112

Undetected real faults = 112- 84 = 28

Q26) A software was tested using the error seeding strategy in which 20 errors were seeded in the code. When the code was tested using the complete test suite, 16 of the seeded errors were detected. The same test suite also detected 200 non-seeded errors. What is the estimated number of undetected errors in the code after this testing? (GATE 2004)

a) 4
b) 50
c) 200
d) 250

Q26) A software was tested using the error seeding strategy in which 20 errors were seeded in the code. When the code was tested using the complete test suite, 16 of the seeded errors were detected. The same test suite also detected 200 non-seeded errors. What is the estimated number of undetected errors in the code after this testing? (GATE 2004)

a) 4
b) 50
c) 200
d) 250

Error seeding, as the name implies, seeds the code with some known errors. In other words, some artificial errors are introduced into the program artificially. The number of these seeded errors detected in the course of the standard testing procedure is determined. These values in conjunction with the number of unseeded errors detected can be used to predict:

- The number of errors remaining in the product.
- The effectiveness of the testing strategy.

Let N be the total number of defects in the system and let n of these defects be found by testing.

Let S be the total number of seeded defects, and let s of these defects be found during testing.

$n/N = s/S$

or

$N = S \times n/s$

Defects still remaining after testing = $N - n = n \times (S - s)/s = 200*(20-16)/16 = 50$

Q27) Number of external inputs (I) = 30
Number of external output (O) = 60
Number of external inquiries (E) = 23
Number of files (F) = 08
Number of external interfaces (N) = 02

It is given that the complexity weighting factors for I, O, E, F and N are 4, 5, 4, 10 and 7, respectively. It is also given that, out of fourteen value adjustment factors that influence the development effort, four factors are not applicable, each of he other four factors have value 3, and each of the remaining factors have value 4. The computed value of function point metric is _____ (GATE 2015)

A. **612.06**
B. 212.05
C. 305.09
D. 806.9

Q27) Number of external inputs (I) = 30
Number of external output (O) = 60
Number of external inquiries (E) = 23
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It is given that the complexity weighting factors for I, O, E, F and N are 4, 5, 4, 10 and 7, respectively. It is also given that, out of fourteen value adjustment factors that influence the development effort, four factors are not applicable, each of he other four factors have value 3, and each of the remaining factors have value 4. The computed value of function point metric is _____ (GATE 2015)

A. **612.06**
B. 212.05
C. 305.09
D. 806.9

Function point metrics provide a standardized method for measuring the various functions of a software application

The value of function point metric = UPF * VAF

Here,

UPF: Unadjusted Function Point (UFP) count

VAF: Value Adjustment Factor

UPF = 4*30 + 60*5 + 23*4 + 8*10 + 7*2 = 606

VAF = (TDI * 0.01) + 0.65

Here TDI is Total Degree of Influence

TDI = 3*4 + 0*4 + 4*6 = 36

VAF = (TDI * 0.01) + 0.65

= 36*0.01 + 0.65

= 0.36 + 0.65

= 1.01

FP = UPF * VAF

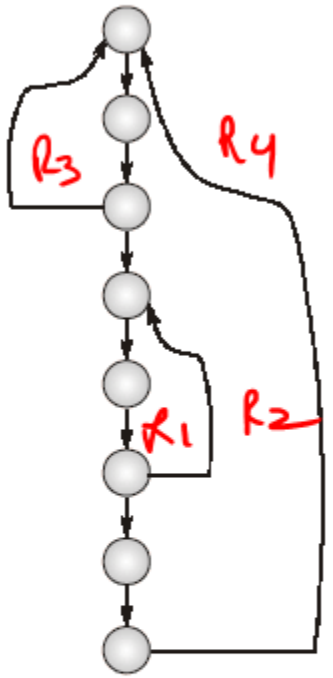
= 1.01 * 606

= 612.06

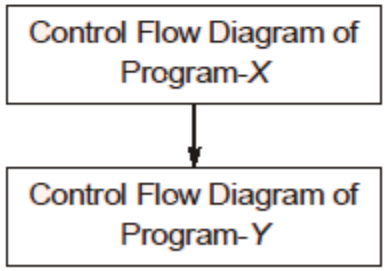
Program-X:

```
sumcal (int maxint, int value)
{
    int restult=0, i=0;
    if (value <0)
    {
        value = –value;
    }
    while ( (i < value) AND (result
< = maxint) )
    {
        i = i + 1;
        result = result + 1;
    }
    if (result <= maxint)
    {
        print f (result) ;
    }
    else
    {
        print f("large");
        print f ("end of program");
}
```

Control Flow Diagram of Program-Y:



Control Flow Diagram of Program-Z:



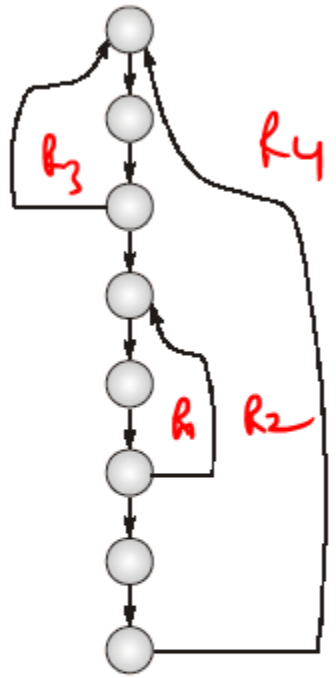
Q28) Values of McCabe's Cyclomatic complexity of Program-X, Program-Y and Program-Z respectively are... (GATE 2015)

A. 4, 4, 7
B. 3, 4, 7
C. 4, 4, 8
D. 4, 3, 8

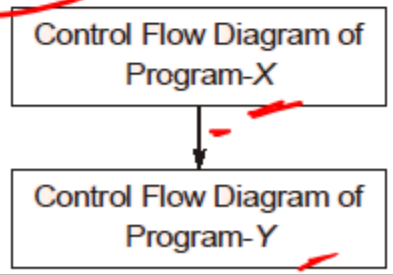
Program-X:

```
sumcal (int maxint, int value)
{
    int restult=0, i=0;
    if (value <0)
    {
        value = –value;
    }
    while ( (i < value) AND (result
< = maxint) )
    {
        i = i + 1;
    result = result + 1;
    }
    if (result <= maxint)
    {
        print f (result) ;
    }
    else
    {
        print f("large");
    print f ("end of program");
}
```

Control Flow Diagram of Program-Y:



Control Flow Diagram of Program-Z:



Q28) Values of McCabe's Cyclomatic complexity of Program-X, Program-Y and Program-Z respectively are... (GATE 2015)

A. 4, 4, 7
B. 3, 4, 7
C. 4, 4, 8
D. 4, 3, 8

```
int module1 (int x, int y) {
  while (x! = y) {
    if (x > y)
        x = x - y,
    else y = y - x;
    }
  return x;
}
```

Q29) What is Cyclomatic complexity of the above module? (GATE 2004)

a) 1
b) 2
c) 3
d) 4

```
int module1 (int x, int y) {
  while (x! = y) {
    if (x > y)
        x = x - y,
    else y = y - x;
     }
  return x;
}
```

2+1

Q29) What is Cyclomatic complexity of the above module? (GATE 2004)

a) 1
b) 2
c) 3
d) 4

```
while (first <= last)
{
  if (array [middle] < search)
     first = middle +1;
  else if (array [middle] == search)
     found = True;
  else last = middle – 1;
  middle = (first + last)/2;
}
if (first < last) not Present = True;
```

toggle

Q30) The cyclomatic complexity of the program segment is __(GATE 2015)

A. 3
B. 4
C. 5
D. 6

condition if-else — 1

```
while (first <= last)
{
  if (array [middle] < search)
     first = middle +1;
  else if (array [middle] == search)
     found = True;
  else last = middle – 1;
  middle = (first + last)/2;
}
if (first < last) not Present = True;
```

Q30) The cyclomatic complexity of the program segment is __(GATE 2015)

A. 3
B. 4
C. 5
D. 6

Q31) Consider the following statements about the cyclomatic complexity of the control flow graph of a program module. Which of these are TRUE? (GATE 2009)

I. The cyclomatic complexity of a module is equal to the maximum number of linearly independent circuits in the graph.
II. The cyclomatic complexity of a module is the number of decisions in the module plus one, where a decision is effectively any conditional statement in the module.
III. The cyclomatic complexity can also be used as a number of linearly independent paths that should be tested during path coverage testing.

A. I and II
B. II and III
C. I and III
D. I, II and III

Q31) Consider the following statements about the cyclomatic complexity of the control flow graph of a program module. Which of these are TRUE? (GATE 2009)

I. The cyclomatic complexity of a module is equal to the maximum number of linearly independent circuits in the graph.
II. The cyclomatic complexity of a module is the number of decisions in the module plus one, where a decision is effectively any conditional statement in the module.
III. The cyclomatic complexity can also be used as a number of linearly independent paths that should be tested during path coverage testing.

A. I and II
B. II and III
C. I and III
D. I, II and III

module control flow

```
int mcq(boolean a, boolean b, boolean c, boolean d) {
   int ans = 1;
   if (a) {
      ans = 2;
   } else if (b) {
      ans = 3;
   } else if (c) {

      if (d) {
         ans = 4;
      }
   }
   return ans;
}
```

2018

4T → 5E

Q32) If M1 = Number of tests to exhaustively test mcq ( ); M2 = Minimum number of tests to achieve full statement coverage for mcq ( ); and M3 = Minimum number of tests to achieve full branch coverage for mcq ( ); then (M1, M2, M3) = _____.

A. (16, 3, 5)
B. (8, 5, 3)
C. (8, 3, 5)
D. (16, 4, 4)

```
int mcq(boolean a, boolean b, boolean c, boolean d) {
   int ans = 1;
   if (a) {
      ans = 2;
   } else if (b) {
      ans = 3;
   } else if (c) {

      if (d) {
         ans = 4;
      }
   }
   return ans;
}
```

Q32) If M1 = Number of tests to exhaustively test mcq ( ); M2 = Minimum number of tests to achieve full statement coverage for mcq ( ); and M3 = Minimum number of tests to achieve full branch coverage for mcq ( ); then (M1, M2, M3) = _____.

A. (16, 3, 5)
B. (8, 5, 3)
C. (8, 3, 5)
D. (16, 4, 4)

Q33) Find if the following statements in the context of software testing are TRUE or FALSE.

(S1) Statement coverage cannot guarantee execution of loops in a program under test.
(S2) Use of independent path testing criterion guarantees execution of each loop in a program under test more than once. (GATE 2008 / NET 2018)

1. True, True
2. True, False
3. False, True
4. False, False

Q33) Find if the following statements in the context of software testing are TRUE or FALSE.

(S1) Statement coverage cannot guarantee execution of loops in a program under test.
(S2) Use of independent path testing criterion guarantees execution of each loop in a program under test more than once. (GATE 2008 / NET 2018)

1. True, True
2. True, False
3. False, True
4. False, False

2 Net

Q34) What is cyclomatic complexity of the above pseudo code?

1
2

```
while (m < n)
  if (x > y ) and (a < b) then
    a=a+1
    y=y-1
  end if
  m=m+1
end while
```

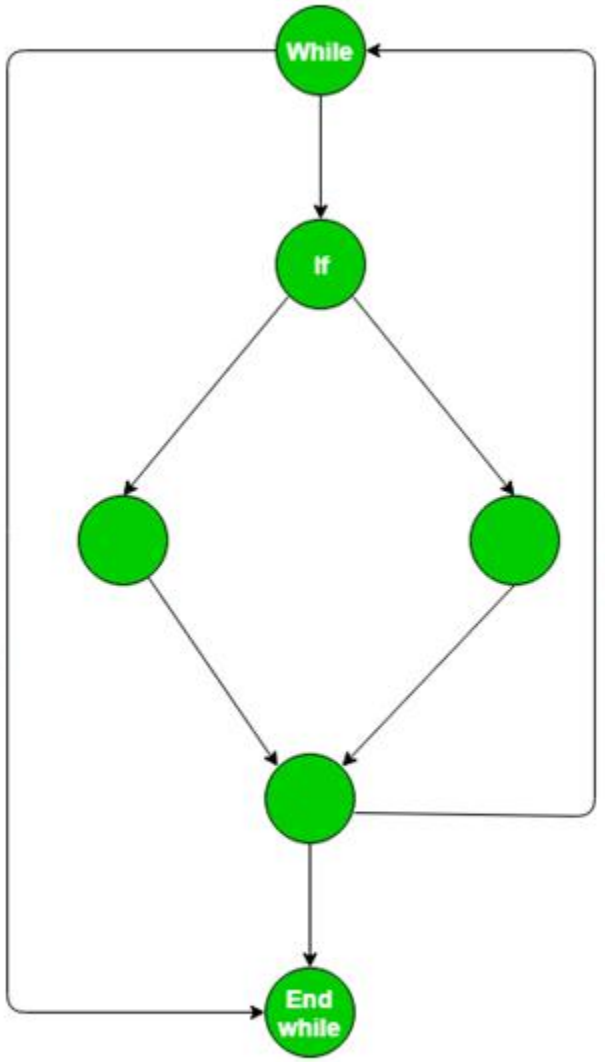
a) 2
b) 3
c) 4
d) 5

Q34) What is cyclomatic complexity of the above pseudo code?

```
while (m < n)
  if (x > y ) and (a < b) then
    a=a+1
    y=y-1
  end if
  m=m+1
end while
```

a) 2
b) 3
c) 4
d) 5

3+1



Q35) The cyclomatic complexity of the flow graph of a program provides ...(GATE 2006)

1. an upper bound for the number of tests that must be conducted to ensure that all statements have been executed at most once
2. a lower bound for the number of tests that must be conducted to ensure that all statements have been executed at most once
3. an upper bound for the number of tests that must be conducted to ensure that all statements have been executed at least once
4. a lower bound for the number of tests that must be conducted to ensure that all statements have been executed at least once

Q35) The cyclomatic complexity of the flow graph of a program provides ...(GATE 2006)

1. an upper bound for the number of tests that must be conducted to ensure that all statements have been executed at most once
2. a lower bound for the number of tests that must be conducted to ensure that all statements have been executed at most once
3. an upper bound for the number of tests that must be conducted to ensure that all statements have been executed at least once
4. a lower bound for the number of tests that must be conducted to ensure that all statements have been executed at least once

branch Coverage

```
begin
 if (a== b) {S1; exit;}
 else if (c== d) {S2;]
    else {S3; exit;}
 S4;
end
```

A. T1, T2, T3
B. T2, T4
C. T3, T4
D. T1, T2, T4

Testcase

also -

Q36) 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? (GATE 2010 / NET 2018)

```
begin
 if (a== b) {S1; exit;}
 else if (c== d) {S2;]
    else {S3; exit;}
 S4;
end
```

A. T1, T2, T3
B. T2, T4
C. T3, T4
D. T1, T2, T4

T1 checks S1

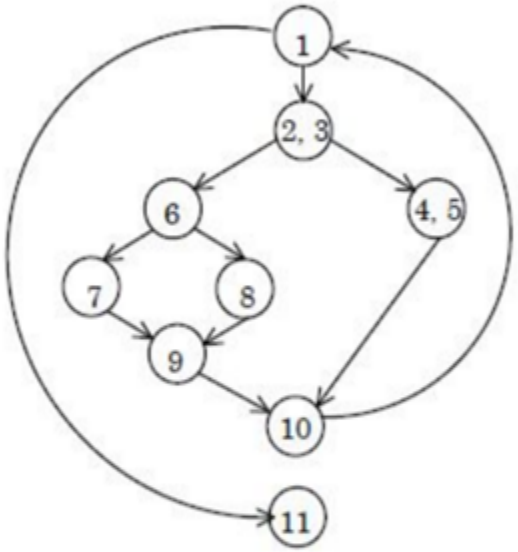
T2 checks S3

T4 checks S2 and S4

Q36) 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? (GATE 2010 / NET 2018)

Answer the following question (91-95) based on flow graph F.

A flow graph F with entry node (1) and exit node (11) is shown below :



Flowgraph F

SubQuestion No : 91

Q.91 How many predicate nodes are there and what are their names?

(1) Three : (1, (2, 3), 6)

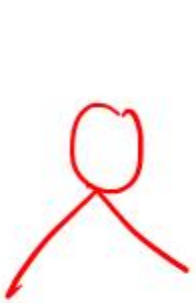
(2) Three : (1, 4, 6)

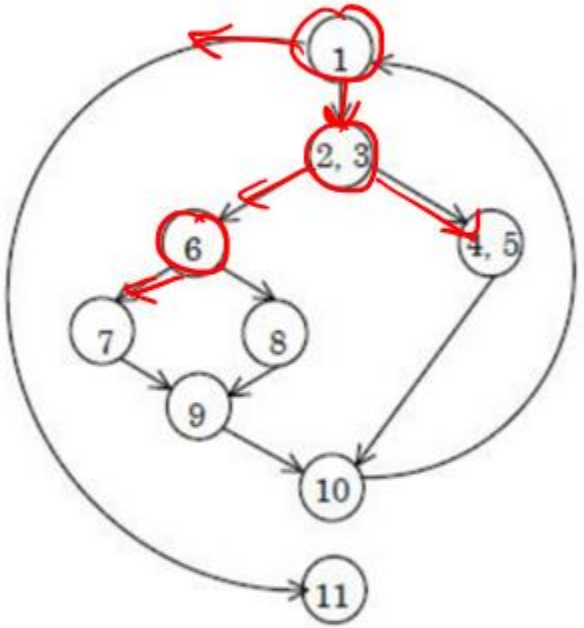
(3) Four : ((2, 3), 6, 10, 11)

(4) Four : ((2, 3), 6, 9, 10)

Answer the following question (91-95) based on flow graph F.

A flow graph F with entry node (1) and exit node (11) is shown below :





Flowgraph F

Condition

SubQuestion No : 91

Q.91 How many predicate nodes are there and what are their names?

(1) Three : (1, (2, 3), 6)

(2) Three : (1, 4, 6)

(3) Four : ((2, 3), 6, 10, 11)

(4) Four : ((2, 3), 6, 9, 10)

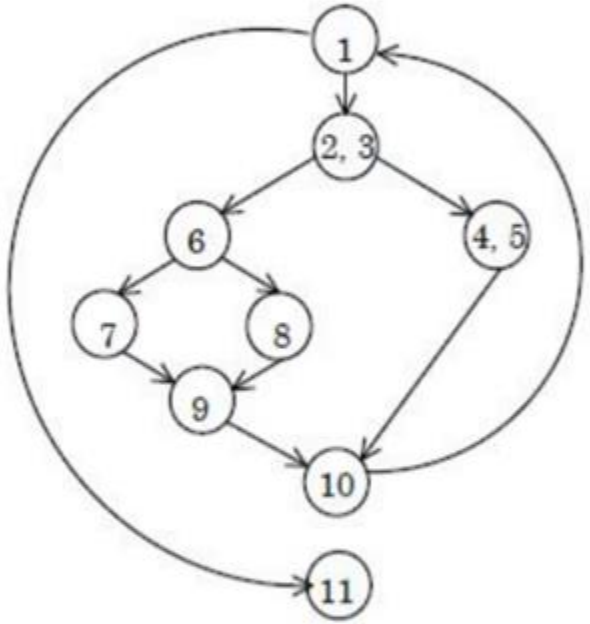
Q38) How many nodes are there in the longest independent path?

a) 6

b) 7

c) 8

d) 9



Flowgraph F

route

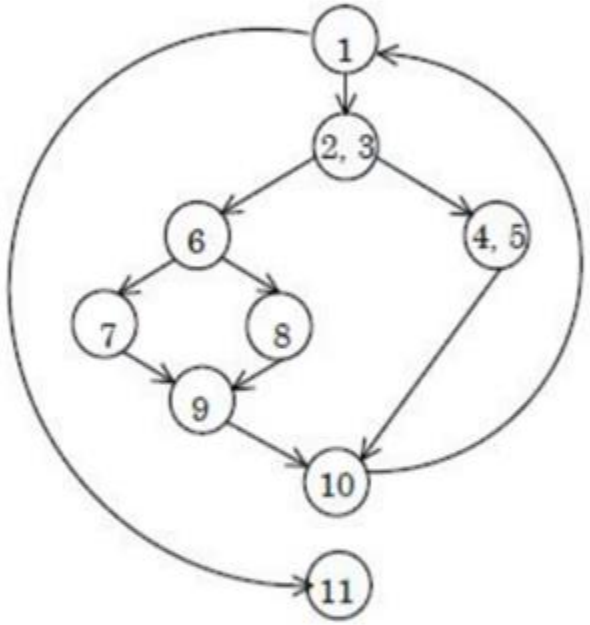
Q38) How many nodes are there in the longest independent path?

a) 6

b) 7

c) 8

d) 9



Flowgraph F

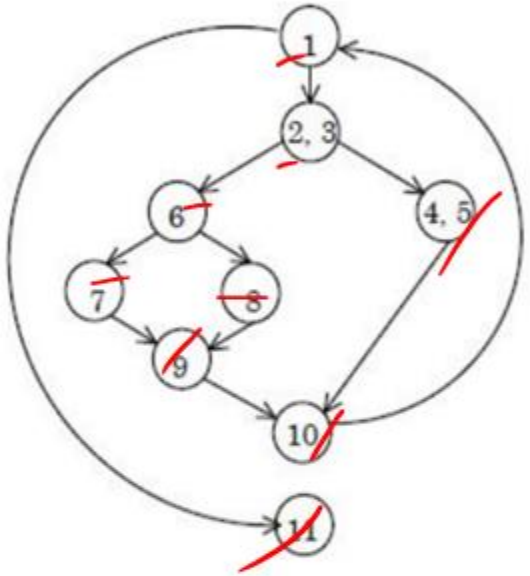
Q39) How many nodes are there in the flow graph F?

a) 9

b) 10

c) 11

d) 12



Flowgraph F

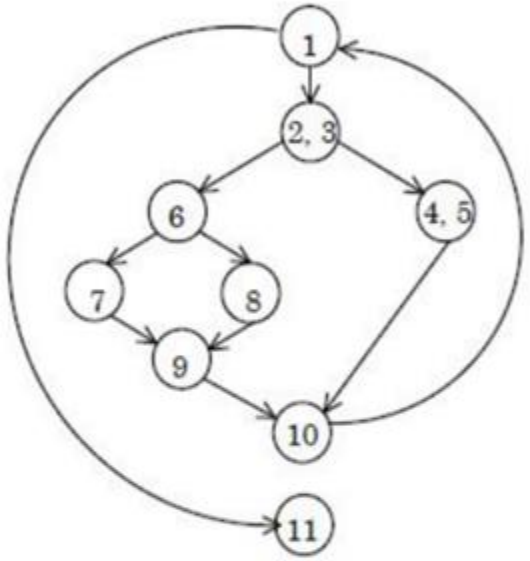
Q39) How many nodes are there in the flow graph F?

a) 9

b) 10

c) 11

d) 12



Flowgraph F

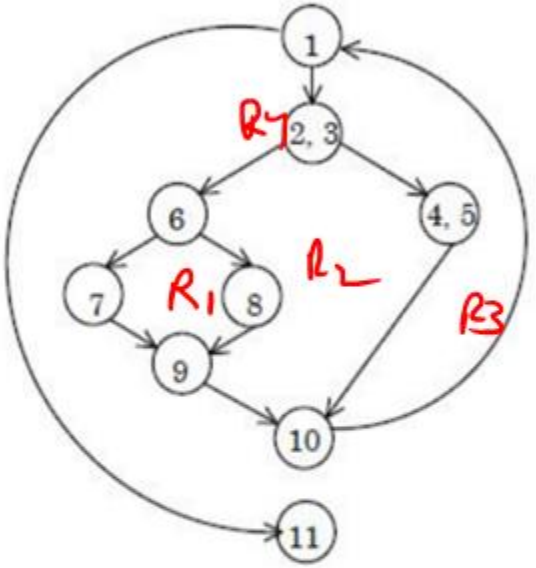
Q40) How many regions are there in the flow graph F?

a) 2

b) 3

c) 4

d) 5



Flowgraph F

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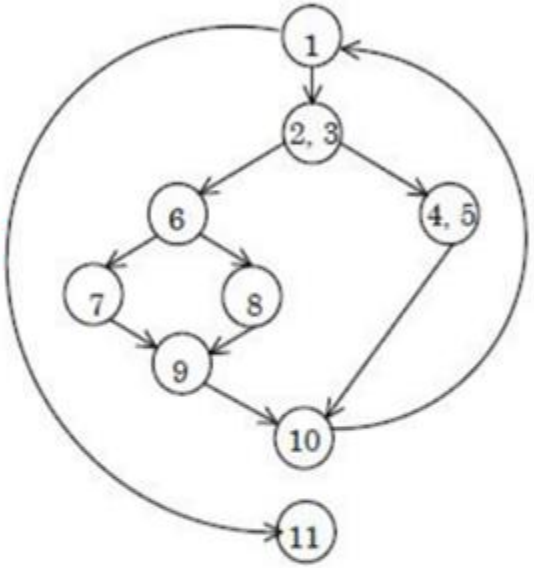
c) 4

d) 5



Flowgraph F

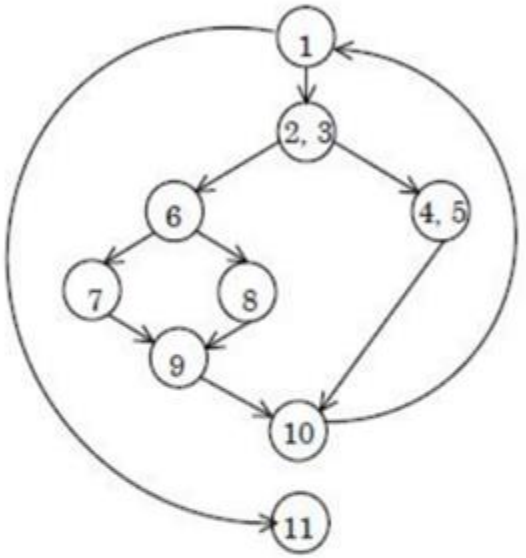
Q41) what is the cyclomatic complexity of the flow graph F?

a) 2

b) 3

c) 4

d) 5



Flowgraph F

P+1

e−n+2p

Region + 1 Unbounded

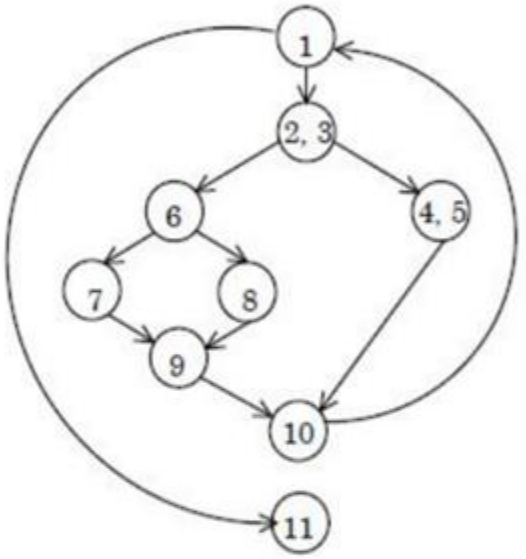
Q41) what is the cyclomatic complexity of the flow graph F?

a) 2

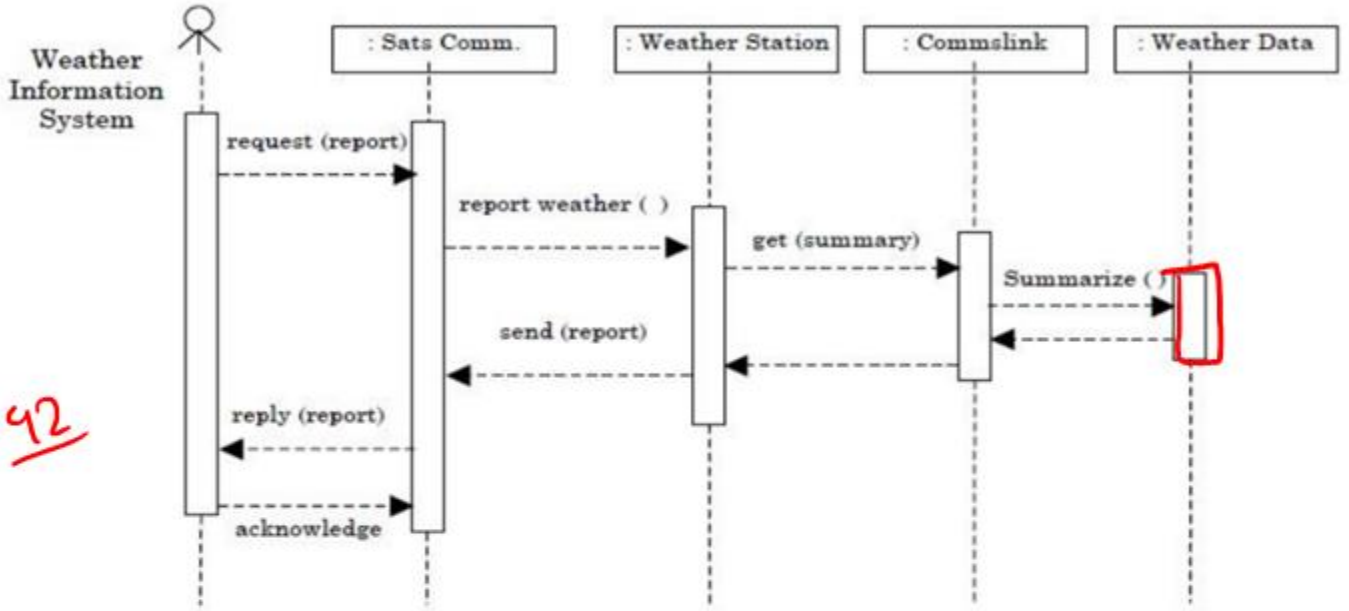
b) 3

c) 4

d) 5



Flowgraph F



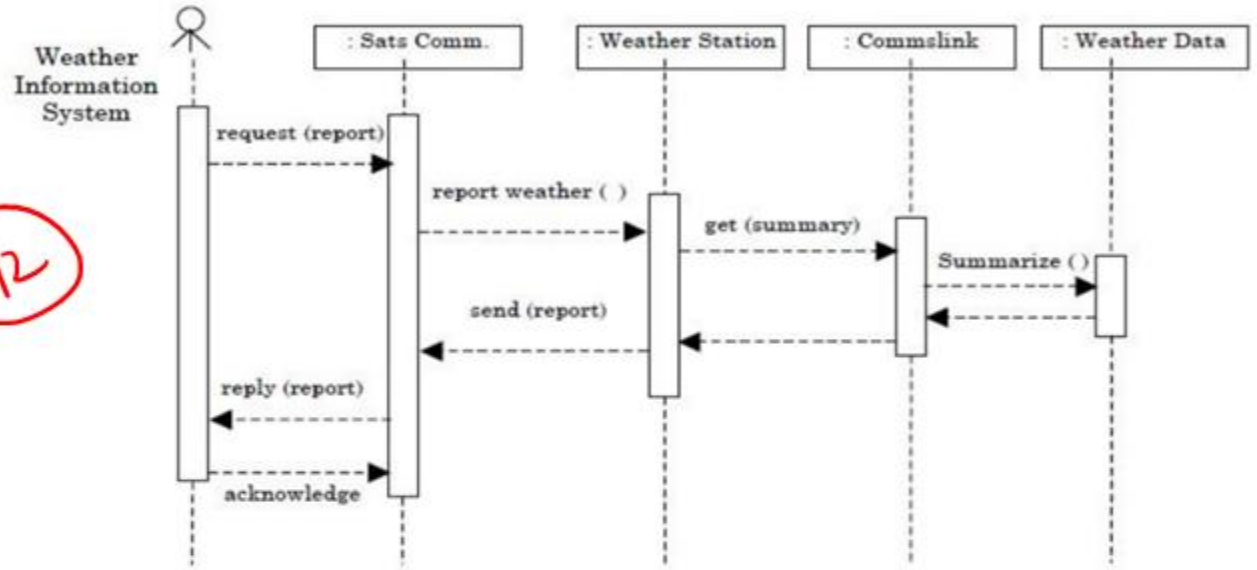
The sequence diagram given in Figure 1 for the Weather Information System takes place when an external system requests the summarized data from the weather station. The increasing order of lifeline for the objects in the system are:

(1) Sat comms → Weather station → Commslink → Weather data

(2) Sat comms → Comms link → Weather station → Weather data

(3) Weather data → Comms link → Weather station → Sat Comms

(4) Weather data → Weather station → Comms link → Sat Comms



42

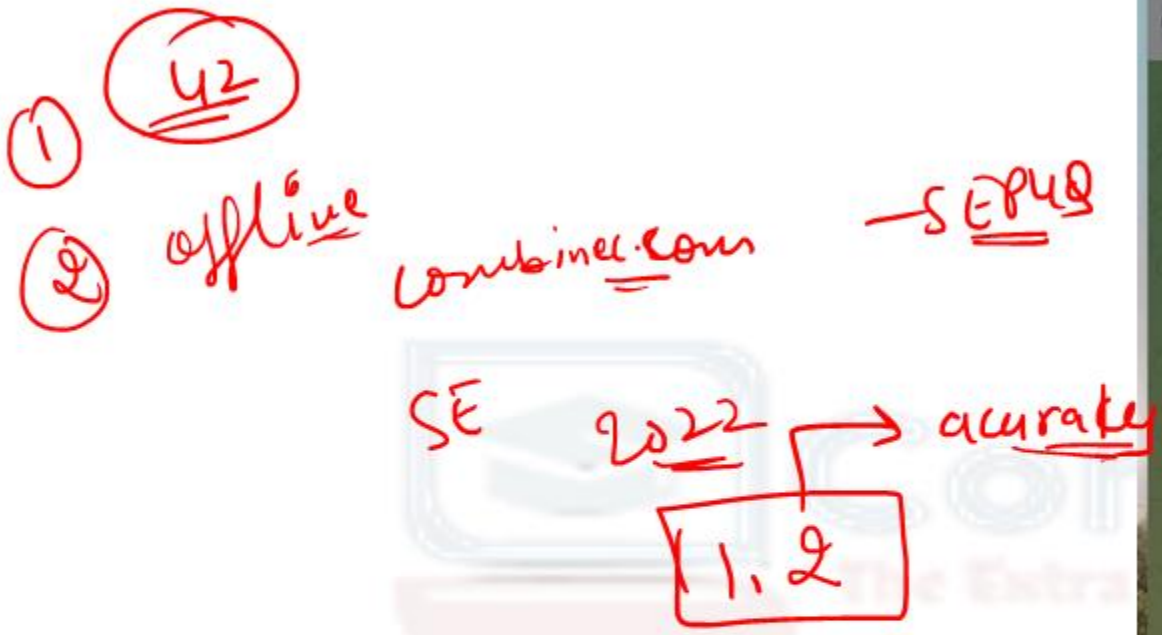
The sequence diagram given in Figure 1 for the Weather Information System takes place when an external system requests the summarized data from the weather station. The increasing order of lifeline for the objects in the system are:

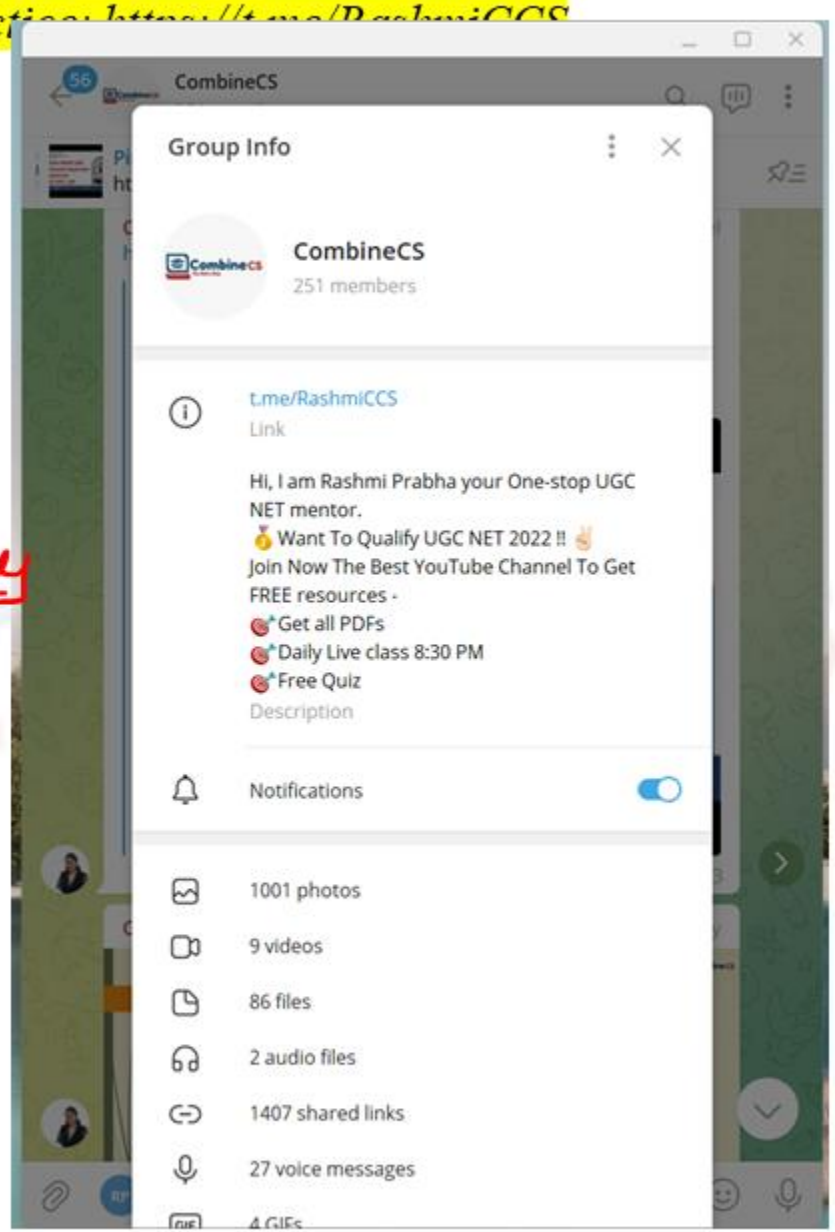
(1) Sat comms → Weather station → Commslink → Weather data

(2) Sat comms → Comms link → Weather station → Weather data

(3) Weather data → Comms link → Weather station → Sat Comms

(4) Weather data → Weather station → Comms link → Sat Comms





A	B	C
June 1st - 15th Schedule	Marathon Session + Practice Ques	
youTube Free Class	PAPER-1 Practice Ques.	PAPER-2 CS Practice Ques.
Way to JRF 2022	4:30 pm - 5:30 pm	9-10 pm
Monday		
Tuesday, 31st May 2022	Practice MCQ Teaching	Practice PYQ AI
Wednesday, 1st June 2022	Practice MCQ Research	Practice Expected MCQ AI
Thursday, 2nd June 2022	Practice MCQ Communication	Practice PYQ SE
Friday, 3rd June 2022	Practice MCQ ICT	Practice Expected MCQ SE
Saturday, 4th June 2022	Practice MCQ LR	Practice PYQ DBMS
Sunday, 5th June 2022	Practice MCQ HE	Practice Expected Bigdata + NoSQL
Monday, 6th June 2022	Practice MCQ PDE	Practice Expected Data Mining
Tuesday, 7th June 2022	Practice MCQ Indian Logic	Practice SQL
Wednesday, 8th June 2022	Practice PYQ TOC + Compiler	Practice PYQ TOC + Compiler
Thursday, 9th June 2022	Practice PYQ CN	Practice PYQ CN
Friday, 10th June 2022	Practice PYQ OS	Practice PYQ OS
Saturday, 11th June 2022	Practice PYQ Discrete Math	Practice PYQ Discrete Math
Sunday, 12th June 2022	Practice DSA	Practice DSA
Monday, 13th June 2022	Practice COA	Practice COA
Tuesday, 14th June 2022	Practice CG	Practice CG
Wednesday, 15th June 2022	Practice Cloud Computing	Practice Web Programming

Tomorrow 3pm doubt

Self Study

15-20

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