Marks Scored:

KATHMANDU UNIVERSITY
End Semester Examination [C]
July, 2017

Level : B.E./B. Sc.
Year : IV
Course : COMP 401
Semester : I
Exam Roll No. :
Registration No. :
Time: 30 mins.
F. M. : 10
Date JUL 12 2017

SECTION "A"
[20 Q × 0.5 = 10 marks]

Pick the correct answer(s).

1. A development team using some systematic approach develops _____.
[a] industrial quality software system [b] programming system
[c] both a & b [d] none of the above

2. Tools provide automated and semi-automated support for _____.
[a] functions [b] procedures [c] methods [d] instructions

3. Its main characteristic is number crunching algorithm.
[a] Artificial Intelligence Software [b] Embedded System
[c] Engineering and Scientific Software [d] Real-Time Software

4. Odd one out from the followings regarding Philosophy of Agile Development.
[a] Informal methods
[b] Active and continuous communication between developers and customers
[c] Minimal software engineering work products
[d] Overall development simplicity

5. Odd one out from the followings regarding system elements.
[a] Procedures [b] Database [c] Documentation [d] Tools

6. Which of the following statement is NOT True?
[a] SRS document should only specify external system behavior
[b] SRS document should be easy to change
[c] SRS document should characterize acceptable responses to undesired events
[d] SRS document should specify only internal system behavior

7. Requirement specification is also known as _____.
[a] technical specification [b] non-technical specification
[c] functional specification [d] non-functional specification

8. Regarding software project management, the following statement is True.
[a] Software product is tangible
[b] There is standard process
[c] Large software projects are often "one-off" projects
[d] Large software projects are often "off-the-shelf" projects

9. Activity networks represent _____.
[a] project plan [b] project management
[c] project schedule [d] resource allocation

10. Walston-Felix Model is _____.
[a] $3.2 * (KLOC)^{1.05}$ [b] $5.2 * (KLOC)^{0.91}$
[c] $3.2 * (KLOC)^{0.91}$ [d] $5.2 * (KLOC)^{1.05}$

11. 11. _____ is not a part of Project Scheduling?
[a] activity dependencies [b] staff allocation
[c] resource management [d] work-break down

12. Doty Model for KLOC > 9 is _____.
[a] $5.288 * (KLOC)^{1.047}$ [b] $5.5 + 0.73 * (KLOC)^{1.16}$
[c] $5.288 * (KLOC)^{1.16}$ [d] $5.5 + 0.73 * (KLOC)^{1.047}$

13. In the software equation by [PUT92], the value of productivity parameter P for business system application is _____.
[a] 10000 [b] 28000 [c] 2000 [d] 5000

14. Typographical errors are detected through
[a] White-Box Testing [b] Glass-Box Testing
[c] Internal Operation Testing [d] All of the above

15. Test Cases find errors in _____.
[a] nodes [b] links [c] relationships [d] both b & c

Fill in the blank.

16. _____ characterizes how software systems are actually developed.

17. _____ focuses on business enterprise.

18. To be most effective, testing should be conducted by a _____.

19. _____ is concerned with costs, plans and schedules.

20. The decision to outsource can be either _____ or _____.

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JUL-12 2017

Level : B.E./B. Sc.
Year : IV
Time : 2 hrs. 30 mins.

Course : COMP 401
Semester : I
F. M. : 40

SECTION "B"

[6Q × 4 = 24 marks]

Attempt *ANY SIX* questions.

1. Define computer software. Explain different types of it.
2. What do you mean by a system? Describe system engineering process.
3. Describe responsibilities of a software project manager.
4. Explain software decomposition techniques.
5. Why Decision Tree is important for project development? Create a Decision Tree with your own assumptions for the required parameters. Justify that why you select the particular approach to other approaches to make software given by a company, based on your assumptions.
6. Define software quality. Explain software reviews.
7. Describe software requirements validation and evolution.

SECTION "C"

[2Q × 8 = 16 marks]

Attempt *ANY TWO* questions.

8. Define agile development. With diagram, explain SCRUM software development process model.
9. Suppose that an organic mode project consists standard components A, B, C, D, E, F, G, and H and the number of occurrences of each component is 12, 15, 9, 13, 18, 11, 8, and 10 respectively. The historical project data shows that the delivered lines of code of the components A, B, C, D, E, F, G, and H are 5000, 4500, 4800, 3900, 3500, 6000, 2700, and 3000 respectively. Calculate (a) Effort (b) Duration and (c) Average Number of People considering followings values.

   $a_b = 2.4$, $b_b = 1.05$, $c_b = 2.5$ and $d_b = 0.35$

10. Write short notes on (*ANY FIVE*):
    a. Testing
    b. Boundary Value Analysis
    c. Resources
    d. Requirement Engineering
    e. Software Crisis
    f. Cyclomatic-Complexity

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Level : B. E.
Year : IV
Course : ETEG 402
Semester : I
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Time: 30 mins.
F. M. : 20
Registration No.:
Date JUL-12 2017

SECTION "A"
[20 Q. × 1 = 20 marks]

Choose the most appropriate option.

1. Calculate the normalized value of electric field for two isotropic point sources having equal amplitude and in-phase quadrature if the angle between axis of point sources and distant point is 30^{o} and spacing between sources is reduced to $\lambda/4$.
a) 0.99 b) 0.524 c) 1.91 d) 2.58

2. If radiation resistance of an antenna is 10 Ω, loss resistance of an antenna is 1 Ω and peak voltage of the generator is 20 V, then calculate the maximum power radiated by an antenna during conjugate matching.
a) 4.13 W b) 2 W c) 3.75 W d) 7.2 W

3. Water vapor is a greenhouse gas in the Earth's atmosphere, responsible for ..... of the atmospheric absorption of thermal radiation by the Earth known as the greenhouse effect.
a) 40% b) 80% c) 60% d) 70%

4. The electromagnetic waves are weakened when penetrating air and water vapor layers. A part of the electromagnetic energy is converted into heat, another part becomes scattered due to the .....
a) variation in atmospheric layers b) molecular interactions
c) ionization of layers d) molecular dipole function

5. The water molecule, in the gaseous state, has three types of transition, one is electronic transition in which the lowest energy transition is in the.....
a) vacuum ultraviolet region b) gamma ray region
c) tropospheric layer d) ionization layer

6. Brewster's angle is an angle of incidence at which light with a particular polarization is perfectly transmitted through a transparent dielectric surface, with.....
a) no refraction b) refraction c) no reflection d) no scattering

7. The dipoles that produce the transmitted light ..... the polarization direction of that light.
a) scatter from b) reflect from c) refract from d) oscillate in

8. In discone antenna ,the length of the cone should be .....of the antenna's lowest operating frequency.
a) a half wavelength b) a quarter wavelength
c) multiple of the wavelength d) smaller than

9. In discone antenna, the cone angle is generally from .....degrees.
a) 35 to 45 b) 20 to 45 c) 25 to 40 d) 30 to 45

10. If the circumference of the helix is significantly less than a wavelength and its pitch is significantly less than ..... the antenna is called a normal-mode helix.
a) a quarter wavelength b) a half wavelength
c) its wavelength d) 25 cm

11. Since large helices are difficult to build and unwieldy to steer and aim, the design is commonly employed only at higher frequencies, ranging from .....
a) 100 GHz to 300 THz b) HF to SHF
c) HF to UHF d) VHF to microwave

12. E-layer of ionosphere ranges from..... miles from earth's surface.
a) 60- 70 b) 60- 70 c) 60- 70 d) 60- 70

13. The critical frequency at an instant observed for E layer is found to be 3 MHz. Find the corresponding concentration of electrons in these layers.
a) 3×10^6 b) 1.73×10^9 c) 4.87×10^{10} d) 0.111×10^{12}

14. If the spacing between turns of helix antenna is 10 cm and diameter of helix is 15 cm then calculate the value of pitch angle.
a) 11.98° b) 10.65° c.) 18.78° d) 12.5°

15. Calculate the radius of radiating near-field region for dipole if the dimension of dipole is 0.43 m and wavelength of radiating signal is 1.72 m.
a) 0.28 m b) 0.215 m c) 0.35 m d) 0.5 m

16. If the input power to a single vertical $\lambda/2$ element is 2 watt, self resistance and loss resistance is 2 Ω and 3 Ω respectively, then calculate its electric field intensity. Assume k=1.
a) 3.6 V/m b) 0.632 V/m c) 1.5 V/m d) 0.55 V/m

17. The troposphere begins at ground level, and its height varies from about 20 km near the equator to..... km in the mid-latitudes.
a) 25 b) 15 c) 18 d) 17

18. High-gain antennas with smaller beam widths will illuminate a smaller .....than low-gain antennas with larger beam widths.
a) scatter volume b) radiation beams c) side lobes d) main lobes

19. For a TEM plane wave traveling through ..... , the wave impedance is everywhere equal to the intrinsic impedance of the medium.
a) space b) a atmosphere
c) a ionospheric layers d) a homogeneous medium

20. Typically as the frequency increases a .....angle of radiation is needed to return the signals to earth. This will mean that higher frequencies tend to lead to .....skip distances.
a) lower, longer b) higher, longer c) lower, smaller d) higher, smaller