Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institute of MAHE, Manipal

FOURTH SEMESTER B.TECH. (INFORMATION TECHNOLOGY)

END SEMESTER EXAMINATION, APRIL 2018

SUBJECT: SOFTWARE ENGINEERING [ICT-2204]

(REVISED CREDIT SYSTEM)
(27/04/2018)

TIME: 3 HOURS **MAX. MARKS: 50**

Instructions to candidates:

- Answer ALL the questions.
- Missing data, if any, may be suitably assumed.

1A. The front office of any hotel is responsible for all room reservations, room allocations, and final settlement of bills. Any company or person can reserve room for their future stay. They have to indicate from what date to what date they need the room. They also have to indicate how many rooms are required. Sometimes the reservations could be cancelled or dates/number of rooms could be changed. For reservation, cancellation or modification of rooms, customer receives an acknowledgement from the hotel.
For the above problem statement draw the following
i.) Usecase diagram ii.) Sequence diagram **5**

1B. Explain the generic testing characteristics. **3**

1C. Explain the deployment level design element with a suitable example. **2**

2A. At the beginning of the call, the telephone line is idle. When the phone receiver is picked from the hook, it gives a dial tone and can accept the dialling of digits. If after getting dial tone, if the user doesnot dial number within a given time interval then time out occurs and the phone line gets idle. After dialling a number, if the number is invalid then some recorded message is played. Upon entry of a valid number, the phone system tries to connect a call and routes it to the proper destination. If the called person answers the phone, conversation can occur. When called person hangs up, the phone disconnects and goes to idle state. Draw the state diagram for the above description of telephone line. **5**

2B. Explain the use of stubs and drivers in software testing with a suitable example. **3**

2C. Discuss any two requirements elicitation techniques. **2**

3A. Explain the linear sequential software development process model that emphasizes an extremely short development cycle with suitable illustration. **5**

3B. What is modularity? Briefly explain the different criteria for effective modularity. **3**

3C. "Software engineering will make us create voluminous and unnecessary documentation and will invariably slow us down." Is the statement true? Justify your answer. **2**

4A. Consider the following code,

```
function Mystery (x, y: integer): integer;
  var s, z: integer;
  s := 1;
  z := -1;
  if x < 0 then
    s := -1;
    x := -x;
  end if;
  if y < 0 then
    s := -s;
    y := -y;
  end if;
  while x >= 0 do
    x:= x - y;
    z:= z + 1;
  end while;
    z := s * z;
  print(z);
  return(z);
end Mystery;
```

(i) Draw the CFG for the code.
(ii) Identify all the independent execution paths and find the cyclomatic complexity of the code. 5

4B. For the project given below:
(a) Draw the activity network representation
(b) Identify the critical path and the project duration

Activity	Predecessors	Time Duration (Days)
A	-	6
B	-	4
C	A	3
D	A	5
E	A	1
F	B, C	4
G	B, C	2
H	E, F	6
I	E, F	5
J	D, H	3
K	G, I	5

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4C. Bring out the differences between composition and aggregation relationship with the help of a suitable example. 2

5A. The hospital has several specialized departments like Cardiology, Gynecologic, Orthopedics, Pediatrics, ENT etc. OPD (Outside Patients Department) is another independent department. A doctor is only associated with one specialized department at a time though he/she can be a member of the OPD department. Each doctor has a visiting time and day in a week. At reception the patient details are entered and the fees are also taken. The patient is tracked on the basis of the Id generated. In routine a patient can visit the doctors either directly selecting a doctor or by getting admitted to the hospital and then a doctor visits the patients. A doctor can prescribe tests for the patient to perform. The patient visits the lab to get done the tests prescribed by his/her doctor. The reports are given to the patient. The payments pertaining to the tests are done at the reception. Referring the reports, the doctor prescribes the patient medicines or further tests or is asked to get admitted. A patient is admitted into a ward of a specialized department (if available) as per the doctors prescription. The number of wards is limited and if there is no vacant ward the admission of the patient is rescheduled. As per the prescription of doctor, the patient is operated on a specified date and time as decided by the doctor who is doing the operation. After the completion of treatment, a patient may get discharged on advice of a doctor and upon the complete payment of all due charges at the reception. On payment of full dues the reception generates a discharge ticket for the patient.
For the Hospital management System described above draw the following:
i.) Class Diagram ii.) Activity Diagram for ward allocation. 5

5B. Draw a context level and level 1 data flow diagram (DFD) for solving quadratic equation. Inputs are three coefficients and the output values are roots of the equation. 3

5C. Define the following with reference to software design:
i.) Abstraction ii.) Control hierarchy 2