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FINAL EXAMINATION

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FALL 23

sec: 12 (ZWB)

CSE 470

SET A

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Ans to qr 1(a)

The suggestion of using waterfall model is not valid for this senario. Waterfall is a seqruential model where each phases are done seqruentially and once a phase ~~it~~ ~~it~~ is done, we can't go back. Hence, the reqruirments have to be well known. Again, it is not for complex and long term projects. It's done in a limited timeline. In the above senario the reqruirements are not well known and the timeline is also unknown. Morreover, it's a complex project and using waterfall is not valid here.

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Ans to qr 1(b)

I suggest using the scrum model in this senario. In scrum model, there are multiple sprints to deliver a project. It involves diverse team and collaboration. Requirements can be changed over every sprint. The product backlog and sprint backlogs are flexible accordingly. In each sprint review and everyday scrum meeting the team members can analyze risks and progress of the project. In the above senario, since the requirements are fully not known, after each sprint those can be updated. Moreover, the organization can build a team using scrum so that they'll send updates after each sprint. Even though, spiral model could be use, due to no mention of unlimited budget, I pick scrum.

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Ans to Qr 2 (a)

The design pattern that should be implemented is singleton pattern. ~~In~~ this pattern only one instance of main class is created using lazy initialization and that object is returned to other classes. Hence, the object is reusuable. ~~It~~ is a creational pattern where ~~ob~~ instance creating is hidden. As in our senario all printers are connected to a server and all requests are sent to the server. The server can adapt singletone pattern and return printing instance to all the printers one by one without having to create object for each one.

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Ans to Q 2 (b)

```
class Printer_Server :                    initialize with
                                           none
  def init (self):            ->
  self._instance_printer = None
                                      when no instance
 def get object(self):  ->            create instance
       if _instance_printer is None:
           instance_iprinter = Printer_server()
       return _instance_printer
  def get_service(self):
           return printer_service

class printer:
   -> code for printer class              calling instance
#call class :                    ->         creation.
 Printer_Object = Printer_Server.get_object()
 Printer_object.get service ( )
```

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Ans to or 3

(A)

$$\text{SIX for sports} = \frac{NMO \times DIT}{NMO + NMA + NMI}$$

$$= \frac{1 \times 2}{1 + 0 + 3}$$

$$= \frac{2}{4} = 0 \cdot 5$$

```
public void hostClub() {                       1
    boolean clubHosted = true;
    int year = 2023;                                 2
    boolean oca = true;
    boolean other = false;
          3                                                    16
    for (int i = 0; i < 3; i++) {  4
        for (int j = 0; j < 3; j++) { 6
                5                                              15
            if (i == 2) {  7
                oca = true;  8
            }

            if (j == 2) {  9
                oca = true;  10
            }

            if (i == 1 ) {  11
                other = true;  12
            }
            if (j == 1) {  13
                other = true;  14
            }
        }
    }
}
  17
    public void starStudentAward() {
        System.out.println("The Star Student of BRAC
University New Campus is Mita");
    }
}
```

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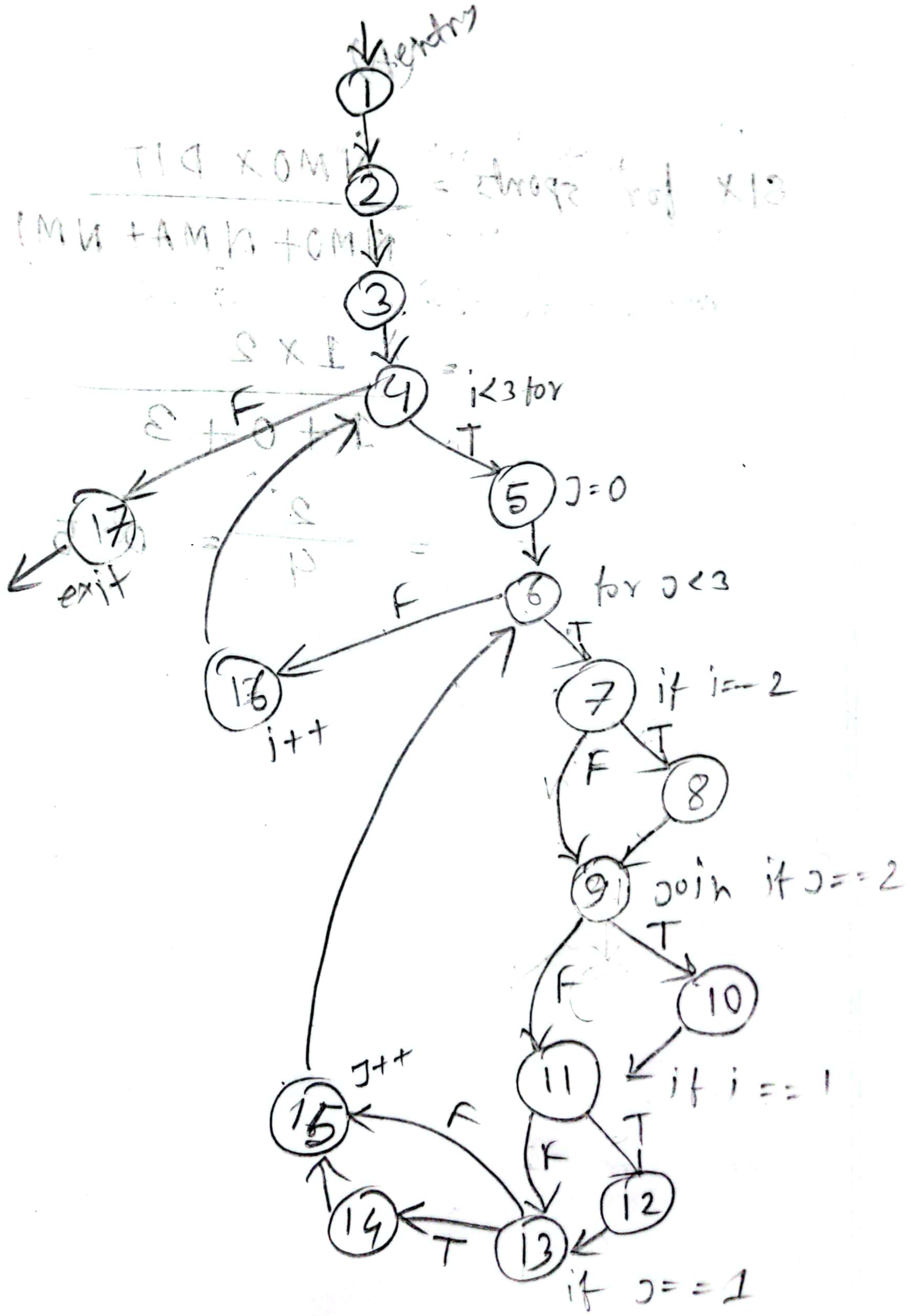
Ans to 3 (b)



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Ans to 3 (c)

cyclomatic complexity

$M = E + 1 = 6 + 1 = 7$

$M = P + 1 = 6 + 1 = 7$

$M = E - N + 2P = 22 - 17 + 2 = 7$

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Ans to ~~Nor~~ 4(a)

codesmells :

1. Unclear function naming
   ex: public string gtNm { }, isMemberd }

2. Dead code : (unused)
   double discount Rate = 0.0

3. Variable naming :
   in Item class, string nm, pc are not meaningful.

4. Comments and duplicates : → there are many comments in first class
   i) comments should be removed
   ii) Duplicate codes make it a long method : shopping cart.addItem()
   ↳ i can use a loop here. and avoid adding to same function

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Ans to or 4 (b)

① Remove comment : // creating items
// creating cus object
# shopping cart object

```
Pub class shopping system {
  ...void main {
     item_object = Create item object (name,
                                       price)
     list. append (item_object)
```

→ Extract method

directly send for name

② I'll need this need for refactoring duplicates later.

```
create item object (name, price) {
        return new Item (name, price) }
```

Similarly for customer object and shopping cart object I can use extract method.

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customer = Create_customer_Object ('name', membership status)

//Define this function to create customer object

shopping cart = Create_shopping cart_Object (customer)

Define this func to create shopcart object.

② Duplicates :

As i have the item objects in a list :

```
for item in list :
    shoppingcart . additem (item)
```

Now if more objects have to be added can be done using this list.

Method : substitute algorithm method.

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③ Dead code :
double discountRate = 0.0
this line is unused so can be removed

④ Proper naming :
1) In Item class, Item method has parameters
string nm, double pc which are unclear.
refactor :
public Item (string name, double price) {
this.name = name
this.price = price.

ii) function names refactor :
a) public double getPrice () {
return price }
b) Public boolean getMembership_status_{
return isMember }

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Additional codesmells of comments in class shopping system!

(I) remove calculating and display the total cost comment and put the lins from double ~~total~~ total cost = 0.0 to end of method in another method called "calculat and display total cost"

(II) in this method now rumore comments such as
// getting discount of 0.2 by wring in a method;

```
getDisount {
    if customer.isMember {
        disount = 0.2
    }
    else { discount = 0.1 }
```

(III) lastly write a printing method for printing and rumore the comment.