



**ČESKÉ VYSOKÉ UČENÍ TECHNICKÉ V PRAZE**

**Masarykův ústav vyšších studií**

**katedra managementu**

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**Vzorové testy z matematiky a anglického jazyka k přijímací zkoušce  
do magisterského studijního programu Řízení rozvojových projektů**

**Obory:**

- Řízení regionálních projektů
- Projektové řízení inovací v podniku

1. Graf funkce  $f : y = \ln \frac{x\sqrt{3}}{3}$  protíná osu  $x$  pod úhlem  
a)  $\frac{2\pi}{3}$ ; b)  $\frac{\pi}{4}$ ; c)  $\frac{\pi}{6}$ ; d)  $0$ . (4 body)
2. Funkce  $f : y = \frac{\sin 5x}{3x}$  pro  $x \neq 0$  je spojitá v celé množině reálných čísel  $\mathbb{R}$ , je-li  
a)  $f(0) = 1$ ; b)  $f(0) = \frac{3}{5}$ ; c)  $f(0) = \frac{5}{3}$ ; d)  $f(0)$  nelze určit. (2 body)
3. Limita  $\lim_{x \rightarrow 0^+} \frac{1}{1 + e^{\frac{1}{x}}}$  je a)  $0$ ; b)  $1$ ; c)  $-\infty$ ; d)  $+\infty$ . (2 body)
4. Funkce  $f : y = x.e^x$  má v bodě  $x = 0$  druhou derivaci  
a)  $f''(0) = 8$ ; b)  $f''(0) = 2$ ; c)  $f''(0) = 4e$ ; d)  $f''(0) = e + 4$ . (4 body)
5. Nejmenší hodnota funkce  $f : y = x - 2 \ln x$  v intervalu  $\langle 1, e \rangle$  je  
a)  $1$ ; b)  $2 - \ln 4$ ; c)  $2 + 2 \ln 2$ ; d)  $e + 4$ . (4 body)
6. Bod  $(1, 1)$  je inflexním bodem funkce  $f : y = x^3 + 2ax^2 - 5x + b$  pro hodnoty parametrů  
a)  $a = 2, b = -5$ ; b)  $a = -\frac{3}{2}, b = 8$ ; c)  $a = \frac{3}{2}, b = -6$ ; d)  $a = -2, b = 7$ . (4 body)
7. Hodnota parciální derivace  $\frac{\partial f}{\partial x}$  funkce  $f : z = \operatorname{arctg} 2xy$  v bodě  $(1, -1)$  je  
a)  $-\frac{2}{5}$ ; b)  $\frac{1}{2}$ ; c)  $0$ ; d)  $-1$ . (4 body)

8. Primitivní funkce k funkci  $f : y = \arcsin 2x$ , pro  $x \in \left(-\frac{1}{2}, +\frac{1}{2}\right)$  je

a)  $F(x) = \frac{2x}{\sqrt{1-4x^2}}$ ,  $x \in \left(-\frac{1}{2}, +\frac{1}{2}\right)$ ; b)  $F(x) = x \cdot \arcsin 2x + \frac{1}{2} \sqrt{1-4x^2}$ ,

$x \in \left(-\frac{1}{2}, +\frac{1}{2}\right)$ ; c)  $F(x) = 2 \arcsin 2x - \sqrt{1-4x^2}$ ,  $x \in \left(-\frac{1}{2}, +\frac{1}{2}\right)$ ;

d)  $F(x) = \frac{2}{\sqrt{1+4x^2}}$ ,  $x \in \left(-\frac{1}{2}, +\frac{1}{2}\right)$ . (4 body)

9. Hodnota určitého integrálu  $\int_1^e \frac{1+\ln x}{x} dx$  je

a)  $2e$ ; b)  $\frac{e}{2}$ ; c)  $\frac{3}{2}$ ; d)  $\frac{1}{2}$ . (4 body)

10. Obsah rovinného obrazce ohraničeného grafy funkcí  $f : y = x^2$ ,  $g : y = \sqrt{x}$  je

a) 1; b)  $\frac{1}{2}$ ; c)  $\frac{1}{3}$ ; d)  $\frac{1}{4}$ . (4 body)

11. Nevlastní integrál  $\int_1^{+\infty} \frac{dx}{e^x \cdot (\ln x)^2}$  je a) konvergentní, b) divergentní. (2 body)

12. Roční výroba má hodnotu 800000. Roční zvýšení je vždy 2%. Hodnota výroby po 5 letech bude

a) 841000; b) 864564; c) 883265; d) 890345. (4 body)

13. Bod nejvíce vzdálený od roviny  $\rho : 2x - 8y + 7z - 153 = 0$  je

a)  $A = [1, 2, 1]$ ; b)  $B = [-2, 1, 2]$ ; c)  $C = [-3, -1, -2]$ ; d)  $D = [7, -4, -3]$ .

(4 body)

14. Vektory  $\vec{a} = (1, 0, 2)$ ,  $\vec{b} = (0, 1, 1)$ ,  $\vec{c} = (5, 3, \lambda)$  jsou lineárně závislé pro

a)  $\lambda = 5$ ; b)  $\lambda = 13$ ; c)  $\lambda = -1$ ; d)  $\lambda = 0$ .

(4 body)

## PART 1 (tasks 1-30)

Read the sentences and write the correct answers that fit into the gaps (A,B or C) on your answer sheet. 10 pts

1. Take it easy. I really don't mind \_\_\_\_\_ a few weeks.  
A wait                                    B to wait                                    C waiting
2. Fred refused \_\_\_\_\_ the room. He insisted on finishing the job.  
A leaving                                    B leave                                    C to leave
3. Last year the competition \_\_\_\_\_ by a student of London University.  
A won                                    B is won                                    C was won
4. Alan Turing, \_\_\_\_\_ died in 1954, was the father of computer science.  
A who                                    B that                                    C which
5. This year's profits will be a little \_\_\_\_\_ than last year's.  
A more high                                    B highly                                    C higher
6. They \_\_\_\_\_ have a lot of money. They go on exotic holidays every year.  
A should                                    B have to                                    C must
7. This version of the software is \_\_\_\_\_.  
A most recent                                    B recentest                                    C the most recent
8. Richard Branson, \_\_\_\_\_ started with almost nothing, is a typical entrepreneur.  
A that                                    B who                                    C which
9. Do you know if my secretary has got my tickets for Hong Kong ready for me? Yes, \_\_\_\_\_ the travel agent.  
A she has been in                                    B she went in                                    C she's been to
10. What \_\_\_\_\_ on Friday afternoon? Can we meet?  
A did you do                                    B are you doing                                    C will you do

Chose the correct word to keep the similar meaning of the sentence. Write your answer (a-d) on your answer sheet. 1 pts

11. Despite putting in a more expensive bid, we won the contract.  
A Although we put in...    B Because we put in...    C So that putting in...    D For putting in...

Chose the correct answer and write it on your answer sheet. (A or B). 1 pts

12. Who did you tell?  
A I told Sue.                                    B Sue told me.

Identify which of the following sentences ask for information (A) and which ask for action (B). Write your answers (A or B) on your answer sheet. 4 pts

13. I wonder if you would mind sending me a new manual for the Creatif software Version 5.0?  
A information                                    B action

14. Can you tell me who I need to write to for such a manual?  
**A** information                      **B** action
15. Do you think you could tell me if a new version is planned?  
**A** information                      **B** action
16. Perhaps you could send me a product list with prices?  
**A** information                      **B** action

**Choose the word which best fits each gap. Mark the correct letter A, B or C on your answer sheet.**

6 pts

17. We've decided to buy our parts from a \_\_\_ in Austria.  
**A** supplier                      **B** supplier                      **C** supplicant
18. John Smith is being \_\_\_ to head office in New York.  
**A** transferred                      **B** transfered                      **C** transfer
19. The conference will be held at the Hilton because they have a huge \_\_\_ hall.  
**A** exhibit                      **B** exhibition                      **C** exhibiting
20. We had to stop \_\_\_ because of a fire in the factory.  
**A** produce                      **B** producement                      **C** production
21. The largest \_\_\_ of computers in the United States is IBM.  
**A** distribution                      **B** distributor                      **C** distributer
22. Donna sent in her \_\_\_ for the job.  
**A** applyment                      **B** apply                      **C** application

23. **One of the following telephone conversations is INCORRECT. Which one is it? Mark the letter A, B, or C on the answer sheet.** 1 pts

- A** A: Could I have the sales department, please?  
 B: Oh, one moment, please. Just putting you through now.
- B** A: Can I have extension 305, please?  
 B: I'm afraid the line is engaged, will you hold?
- C** A: Hello, could I speak to Mr.White, please?  
 B: Answering. How can I help you?

**Find the right solution (A-D) to the problem (24-27).Mark the correct letter A-D on the answer sheet.**

4 pts

- A** I'll take you to the airport.                      **B** Please have a dessert on the house.                      **C** I'll explain them to you.                      **D** I'll call the messenger and ask where he is
24. I can't understand these figures.
25. I can't get an answer from the taxi service.
26. The two deliveries haven't arrived yet.
27. The service in this restaurant is terrible.

For each definition, mark the correct word A,B, or C on the answer sheet.

3 pts

28. The loss of a job by an employee because there is no longer any work.  
A currency                      B redundancy                      C occupancy
29. Total amount of money a company receives from selling its products.  
A costs                              B wages                              C turnover
30. Personal assessment  
A finding people for jobs              B paying people              C evaluation of how well people are doing their jobs

**PART 2 (tasks 31-50)**

Complete the text with the words from the boxes. Mark the correct letter (A-D) on your answer sheet.

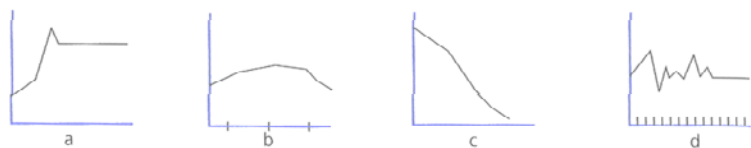
6 pts

The recent history of the company is a tremendous success story. Over the last four years the group has 31)\_\_\_\_\_ enormously. It now operates in 70 countries, and the number of shops worldwide has 32)\_\_\_\_\_ from 2000 to 3000. In this time the group has 33)\_\_\_\_\_ two new chains, and has opened 200 new shops in Japan and 300 in the rest of the world. This year, net revenues have 34)\_\_\_\_\_ a level of €8million, and the group has 35)\_\_\_\_\_ profits of €1million. All its activities are controlled from Tokyo, where the group has recently 36)\_\_\_\_\_ into new headquarters.

- 31 A made                              B grown                              C launched                              D reached
- 32 A turned                              B made                              C increased                              D reached
- 33 A moved                              B remained                              C attached                              D launched
- 34 A made                              B reached                              C increased                              D grown
- 35 A made                              B attached                              C reached                              D increased
- 36 A made                              B moved                              C launched                              D reached

Match each description (1-4) to one of the graphs (a-d). Mark the correct letter (A-D) on your answer sheet.

4 pts



37. The level of investment rose suddenly.
38. At the end of the first year sales stood at...
39. The sudden collapse in real estate price has surprised everyone.
40. The value of shares has shown a steady decline.

Read the advertisement below for a hot drinks machine. Mark each statement below the text A (true), B (false) or C (the text doesn't say) on your answer sheet.

7 pts

### ADVERTISING FEATURE

#### **Save money and keep your staff happy**

*It can be expensive to keep the canteen open to serve drinks to your staff through the day. Our QVM hot drinks machine replaces this service, so that you can close the canteen between mealtimes.*

*You can install the QVM hot drinks machine anywhere in the building. One machine is suitable for a staff of ten to fifteen people. It costs £1,300 to buy, or £11.00 per week to rent over 60 months. It is not expensive to operate: for example, the cost of power for one day is 30p, nearly as cheap as the price of one hot drink from the machine.*

*Our company will carry out a weekly service, at a charge of £10.00. We can also refill the machine with drinks ingredients for an extra charge of £8.00. Some customers prefer to do this themselves, however.*

*There are eight choices of hot drink available from the QVM machine, and our company offers one month's trial free of charge, so that you can estimate how popular the machine will be and what the actual savings are.*

	True	False	Does n't say
41 With a QVM machine, companies can avoid having a canteen altogether.	A	B	C
42 The QVM machine provides enough hot drinks for fifteen people.	A	B	C
43 Most customers prefer to rent the QVM machine over sixty months.	A	B	C
44 The electricity used daily by the machine costs less than the price of a hot drink.	A	B	C
45 The machine company empties the money from the machine as part of its service agreement.	A	B	C
46 Customers can refill their machines with drinks ingredients, if they want to.	A	B	C
47 During the trial period, the customer pays a reduced amount to rent the machine.	A	B	C

Read the following messages (48-50). For each message, mark one explanation (A, B or C) on your answer sheet. 3 pts

48 Add any comments to our proposal in pencil – these will then be discussed at the next committee meeting.

The meeting will consider

- A the company's plans for the future.
- B the performance of the committee.
- C suggested changes to the document.

49 All Staff:  
Regular customers will no longer be allowed a discount unless they buy in bulk.

- A Discounts will be offered to regular customers on orders of any size.
- B Established customers will only qualify for price reductions on large orders.
- C Customers can continue to get a discount if they place orders frequently.

50 BOOKSTORE  
To: Office Staff/Customer Orders Department  
From: Ted Smith/Warehouse Manager  
  
Due to stock relocation, orders already placed will not be despatched between June 3 and June 10.

- A Office staff will transfer to a new location on June 10.
- B Warehouse workers should remove out-of-date stock by June 10.
- C Customers have to wait until after June 10 for recent orders.